Site Specific

Environmental Assessment

Rangeland Mormon Cricket Suppression Program

Idaho

EA Number: ID-06-01

Prepared by:

United States Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection and Quarantine
9134 West Blackeagle Drive
Boise Idaho 83709

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I. Need for Proposed Action

A. Purpose and Need Statement

An infestation of Mormon crickets does occur on federally managed rangelands in southern Idaho. The Animal and Plant Health Inspection Service (APHIS) may, upon request by federal land managers, conduct treatments to suppress Mormon cricket infestations.

Populations of Mormon crickets that trigger the need for a suppression program are normally considered on a case-by-case basis. Participation is based on potential damage such as reduction of critical forage and habitat for some species of wildlife and livestock, destruction of rangeland revegetation projects, creation of public nuisances, and endangerment of road traffic; and benefits of treatments including protection of forage and habitat, increased probability of success for rangeland revegetation projects, elimination of public nuisances, and prevention of hazards to road traffic. Some populations may not cause substantial damage to native rangeland yet may require suppression to prevent damage to high economic value crops on adjacent private land. The goal of the proposed suppression program analyzed in this EA would be to reduce Mormon cricket outbreak population levels in order to protect rangeland ecosystems and/or private cropland adjacent to rangeland.

This environmental assessment (EA) analyzes potential environmental consequences of the proposed action and its alternatives. This EA applies to a proposed suppression program that would take place from April 1, 2006 to August 15, 2006 in southern Idaho.

This EA is prepared in accordance with the requirements under the National Environmental Policy Act of 1969 (NEPA) (42 United States Code § 4321 *et. seq.*) and the NEPA procedural requirements promulgated by the Council on Environmental Quality, United States Department of Agriculture (USDA), and APHIS.

B. Background Discussion

In rangeland ecosystem areas of the United States, Mormon cricket populations can build up to outbreak levels despite even the best land management and other efforts to prevent outbreaks. At such a time, a rapid and effective response may be requested and needed to reduce the destruction of rangeland vegetation. In

some cases, a response is needed to prevent Mormon cricket migration to cropland adjacent to rangeland.

APHIS conducts surveys for Mormon cricket populations on rangeland in the Western United States, provides technical assistance on Mormon cricket management to land owners/managers, and may cooperatively suppress Mormon crickets when direct intervention is requested by a Federal land management agency or a State agriculture department (on behalf of a State or local government, or a private group or individual). APHIS' enabling legislation provides, in relevant part, that on request of the administering agency or the agriculture department of an affected State, the Secretary, to protect rangeland, shall immediately treat Federal, State, or private lands that are infested with grasshoppers or Mormon crickets 7 U.S.C. § 7717(c)(1). The need for rapid and effective response when an outbreak occurs limits the options available to APHIS. The application of an insecticide within all or part of the outbreak area is the response available to APHIS to rapidly suppress or reduce (but not eradicate) Mormon cricket populations and effectively protect rangeland.

In June 2002, APHIS completed an Environmental Impact Statement (EIS) document concerning suppression of grasshopper and Mormon cricket populations in 17 Western States (Rangeland Grasshopper and Mormon Cricket Suppression Program, Environmental Impact Statement, June 21, 2002). The EIS described the actions available to APHIS to reduce the destruction caused by grasshopper populations in 17 States (Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming).

In Idaho in 2006, APHIS would only conduct suppression programs on federally managed rangelands at the request of the federal land manager. APHIS would not conduct suppression programs on state or private lands. APHIS is authorized to treat state and private lands on request of Idaho State Department of Agriculture (ISDA), but the constraints under which APHIS conducts treatments has resulted in determinations by ISDA that no such request will be made.

Although over five million acres of federally managed rangeland may be infested in 2006, APHIS would only treat areas where outbreaks required suppression. In recent years APHIS treatments for Mormon crickets and grasshoppers totaled:

Year	Acres Treated	
	Mormon crickets	Grasshoppers
2005	68,520 acres	2394 acres
2004	18,945 acres	2520 acres
2003	13,585 acres	11705 acres
2002	340 acres	250 acres
2001		420 acres
2000		1100 acres

Although utilization of chemical insecticides is the only option available to APHIS for suppression programs, land managers may be able to utilize some Integrated Pest Management (IPM) tools to help hold infestations below severely damaging levels. IPM tools might include:

Mechanical Control
In the earlier half of the 20th Century, mechanical flails and "hopper-dozer" collection devices were used to kill Mormon crickets. These devices would not be compatible with contemporary precepts regarding destruction of rangeland plant life due to their effects on sagebrush and other shrubs.

Chemical Control
Insecticides can be effective in reducing Mormon cricket populations. However, in IPM systems, insecticides must be applied only when their use is warranted by potential economic loss and justified with respect to other environmental concerns.

Biological Control
Conservation of the natural predators, parasites, and pathogens sometimes help hold Mormon cricket populations below outbreak levels. Avoidance of unwarranted insecticide applications is a key measure in such conservation programs. Some birds and mammals are very effective predators on Mormon crickets. Domestic birds including turkeys and geese have been used in some localized areas to reduce Mormon cricket populations.

Classical biological control is based on importing and releasing foreign biological control agents to control exotic invasive species. Classical biological control is not an option for Mormon crickets, because Mormon crickets are a native species.

Stakeholders have suggested that the biological insecticide *Nosema locustae* should be utilized in suppression programs in Idaho. Although some testimonials and limited research exist regarding the effectiveness of *Nosema locustae*, it is not likely to provide effective suppression in Idaho. It does exist naturally in the overall population, but it loses much of its viability at temperatures over 70 degrees F. (Evans 1990).

Cultural Control
USDA's Agricultural Research Service and Land Grant University researchers have accomplished significant research on grazing management and its impacts on grasshopper population density (Onsager 1996, Manske 1996, Onsager 2000). However, this research is primarily applicable to grasshoppers in short grass prairie ecosystems, not to Mormon crickets in the rangelands of the Great Basin. Fielding and Brusven (1996) concluded that grasshopper population densities in Idaho could be decreased in the

short term by increasing stocking rates of cattle two to three fold versus the normal stocking rate. However, they also concluded that this practice would have negative long term effects including the promotion of high densities of pest grasshopper species.

In commentary on the EIS , another federal agency suggested burning and flooding rangeland to manage Mormon crickets. Private landowners have also suggested burning rangeland to eliminate Mormon crickets.

Mormon cricket populations can build up to outbreak levels despite even the best land management and other efforts to prevent outbreaks. At such a time, a rapid and effective response may be needed to reduce the destruction of rangeland vegetation and protect crops. Unfortunately, there is currently no reliable way to accurately predict the locations and severity with which outbreaks will occur.

APHIS conducts annual surveys for Mormon cricket populations on rangeland in Idaho. APHIS also provides ongoing technical assistance on Mormon cricket management to land owners and managers. APHIS works cooperatively to suppress Mormon cricket outbreaks on Federal land when direct intervention is requested by the Federal land management agency and APHIS determines that intervention is appropriate. Results of the 2005 Idaho Mormon cricket surveys and treatments are in a report which is available at: http://www.agri.state.id.us/Categories/PlantsInsects/GrasshopperMormonCricketControlProgram/ghprogramenvirodocs_pubs_reports.php. Requests for the report may be sent to USDA APHIS PPQ, 9134 West Blackeagle Drive, Boise ID 83709 or faxed to 208-378-5794.

In May 2002, APHIS and the Forest Service (FS) signed a Memorandum of Understanding (MOU) detailing cooperative efforts between the two agencies on suppression of grasshoppers and Mormon crickets on national forest system lands (Document #02-IA-11132020-106, May 29, 2002). This MOU clarifies that APHIS will prepare and issue to the public site-specific environmental documents that evaluate potential impacts associated with proposed measures to suppress economically damaging grasshopper and Mormon cricket populations. The MOU also states that these documents will be prepared under the APHIS NEPA implementing procedures with cooperation and input from the FS. The MOU further states that the responsible FS official will request in writing the inclusion of appropriate lands in the APHIS suppression project when treatment on national forest land is necessary. The FS must also approve a Pesticide Use Proposal (Form FS-2100-2) for APHIS to treat infestations. According to the provisions of the MOU, APHIS can begin treatments after APHIS issues an appropriate decision document and FS approves the Pesticide Use Proposal.

In February, 2003, APHIS and BLM signed a MOU detailing cooperative efforts between the two agencies on suppression of grasshoppers and Mormon crickets on BLM managed lands, APHIS PPQ MOU # 03-8100-0870-MU. This MOU

clarifies that APHIS will prepare and issue to the public site-specific environmental documents that evaluate potential impacts associated with proposed measures to suppress economically damaging Mormon cricket populations. The MOU also states that these documents will be prepared under the APHIS NEPA implementing procedures with cooperation and input from the BLM. The MOU further states that the responsible BLM official will request, in writing, the inclusion of appropriate lands in the APHIS suppression project when treatment on BLM managed land is necessary. The BLM must also prepare a Pesticide Use Proposal for APHIS to treat infestations. According to the provisions of the MOU, APHIS could begin treatments after APHIS issues an appropriate decision document and BLM approves the Pesticide Use Proposal.

APHIS and ISDA cooperate under MOU 03-8100-0403-MU to protect agricultural, horticultural and timber, and natural plant resources from losses caused by plant pests. This cooperation is conducted by APHIS by virtue of authority included in the act establishing the United States Department of Agriculture and the Plant Protection Act of June 20, 2000, (7 USC 7701-7772), which defines plant pests, and provides the Secretary of Agriculture authority to cooperate with States or political subdivisions thereof, farmers' associations, and similar organizations, and individuals to eradicate, suppress, control, or to prevent or retard the spread of the plant pests. ISDA manages Mormon cricket suppression programs on state and private lands, and APHIS manages Mormon cricket suppression programs on federally managed lands.

C. Scoping and Input From the Public

October 17, 2005, APHIS mailed a scoping document to individuals and organizations who had indicated interest in Mormon cricket as well as grasshopper suppression programs in past years and other stakeholders. ISDA assisted by issuing a notice of availability and posted the scoping document on their public website.

Three alternatives were proposed for comment as follows:

Alternative 1. No Action:
APHIS would not conduct insecticide treatments or any other grasshopper/Mormon cricket suppression measures.

Alternative 2.Insecticide Bait or Spray Applications to Suppress Grasshopper/Mormon cricket populations:
Upon evaluation of the population density and environmental conditions APHIS might conduct insecticide treatments with carbaryl bait, or diflubenzuron spray, or malathion spray to suppress grasshopper/Mormon cricket outbreaks. Grasshopper treatments would be limited to within one mile of agricultural cropland.

Alternative 3. Insecticide Bait or Spray Applications to Suppress grasshopper/Mormon cricket populations:
Upon evaluation of the population density and environmental conditions APHIS might conduct insecticide treatments with carbaryl bait, or diflubenzuron spray, or malathion spray to suppress grasshopper/Mormon cricket outbreaks.

Summaries of responses:

Three County Commissions in Idaho responded. Two expressed support for grasshopper and Mormon cricket suppression in general. The Board of Blaine County Commissioners expressed concerns with the protection of water quality, aquatic life, plant life, insect populations and agency compliance with the Clean Water Act. They also expressed concerns regarding cumulative impacts, drift from aerial applications and the toxicity of malathion and carbaryl spray to aquatic life. They recommended that malathion and carbaryl sprays be eliminated from consideration in the program.

One Idaho State Department responded. Idaho Department of Environmental Quality (DEQ) requested that perennial streams be avoided during application of pesticides and that the option least likely to result in pesticides entering ground or surface waters be considered.

Two formal organizations responded. The Idaho Wheat Commission indicated that Alternative 3 should be selected and implemented. Idaho Conservation League responded and expressed concerns about the protection of water quality and compliance with the Clean Water Act and suggested that APHIS needed an NPDES permit. They expressed concerns about the protection of federally protected species and suggested a single EIS would be more appropriate under NEPA than a number of EA's addressing smaller areas. They suggested that APHIS should present an alternative that incorporates biological and behavioral controls, increase buffers to reduce drift impacts and eliminate malathion and carbaryl spray from consideration in the program. They felt alternative two would have less impact on the environment than alternative three.

Seven individuals responded. Three expressed support for alternative three and two for suppression of grasshoppers and Crickets in general. One individual stated that the use Diflubenzuron is the most effective way to control crickets and that survey and control efforts needed to begin earlier and cover a larger area to be effective. One individual offered a proposal to harvest Mormon Crickets for sale as fish bait or as a possible food source in overseas markets. The proposal suggested the crickets could be processed into a feed for poultry, commercial fish farms and for exotic animals.

APHIS has considered all the responses and has incorporated elements of the responses into this EA.

D. About This Process

The EA process for Mormon cricket management is complicated by the fact that there is very little time between requests for treatment and the need for APHIS to take action with respect to those requests. Surveys help to determine general areas, among the millions of acres that potentially could be affected, where Mormon cricket infestations may occur in the spring of the following year. There is considerable uncertainty, however, in the forecasts, so that framing specific proposals for analysis under NEPA is not possible. At the same time, the program strives to alert the public in a timely manner to its more concrete treatment plans and avoid or minimize harm to the environment in implementing those plans.

The 2002 EIS provides a solid analytical and regulatory foundation; however, it may not be enough to satisfy NEPA completely for actual treatment proposals, and the "conventional" EA process will seldom, if ever, meet the program's time frame of need. Thus, a two-stage NEPA process has been designed to accommodate such situations. For the first stage, this EA will analyze aspects of environmental quality that could be affected by Mormon cricket treatment in southern Idaho. This EA will be made available to the public for a 30-day comment period. If comments are received during the comment period, they will be considered for incorporation into the program. For stage 2, when the program receives a treatment request and determines that treatment is necessary, the specific site within southern Idaho will be extensively examined to determine if environmental issues exist that were not covered in this EA. This stage is intended mainly to insure that significant impacts in the specific treatment area will not be experienced. A supplemental determination will be prepared to document this finding and would also address any comments received on this EA. Supplemental determinations prepared for specific treatment sites will be provided to all parties who request them.

II. Alternatives

The alternatives presented in the 2002 EIS and/or considered for the proposed action in this EA are: (A) no action; (B) insecticide applications at conventional rates and complete area coverage; (C) reduced agent area treatments (RAATS); and (D) modified reduced agent area treatments (RAATS). Each of the first three alternatives, their control methods, and their potential impacts were described and analyzed in detail in the 2002 EIS. Copies of the complete 2002 EIS document are available for review at 9134 West Blackeagle Drive, Boise Idaho. It is also available at the Rangeland Grasshopper and Mormon Cricket Program web site, http://www.aphis.usda.gov/ppd/es/ppqdocs.html.

The 2002 EIS is intended to explore and explain potential environmental effects associated with grasshopper suppression programs that could occur in 17 Western States (Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska,

Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming). The 2002 EIS outlines the importance of grasshoppers as a natural part of the rangeland ecosystem. However, Mormon cricket outbreaks can compete with livestock for rangeland forage and cause devastating damage to crops and rangeland ecosystems. Rather than opting for a specific proposed action from the alternatives presented, the 2002 EIS analyzes in detail the environmental impacts associated with each programmatic action alternative related to grasshopper suppression based on new information and technologies.

All insecticides used by APHIS for Mormon cricket suppression are used in accordance with applicable product label instructions and restrictions. Representative product specimen labels can be accessed at the Crop Data Management Systems, Inc. web site at www.cdms.net/manuf/manuf.asp. Labels for actual products used in suppression programs will vary, depending on supply issues. All insecticide treatments conducted by APHIS will be implemented in accordance with APHIS' treatment guidelines, included as Appendix 1 to this EA.

A. No Action Alternative

Under Alternative A, the no action alternative, APHIS would not fund or participate in any program to suppress Mormon cricket infestations. Under this alternative, APHIS may opt to provide survey information and limited technical assistance, but any suppression program would be implemented by a Federal land management agency, a State agriculture department, a local government, or a private group or individual.

B. Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative

Alternative B, insecticide applications at conventional rates and complete area coverage, is generally the approach that APHIS used for many years. Under this alternative, carbaryl, diflubenzuron (Dimilin®), or malathion would be employed. Carbaryl and malathion are insecticides that have traditionally been used by APHIS. The insect growth regulator, diflubenzuron, is also included in this alternative. Applications would cover all treatable sites within the designated treatment block per label directions. The application rates under this alternative are as follows:

- 16.0 fluid ounces (0.50 pound active ingredient (lb a.i.)) of carbaryl spray per acre;
- 10.0 pounds (0.50 lb a.i.) of 5 percent carbaryl bait per acre;
- 1.0 fluid ounce (0.016 lb a.i.) of diflubenzuron per acre; or
- 8.0 fluid ounces (0.62 lb a.i.) of malathion per acre.

In accordance with EPA regulations, these insecticides may be applied at lower rates than those listed above. Additionally, coverage may be reduced to less than the full area coverage, resulting in lesser effects to nontarget organisms.

The potential generalized environmental effects of the application of carbaryl, diflubenzuron, and malathion, under this alternative are discussed in detail in the 2002 EIS (Environmental Consequences of Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative, pp. 38–48). A description of anticipated site-specific impacts from this alternative may be found in Part V of this document.

C. Reduced Agent Area Treatments (RAATs) Alternative

Alternative C, RAATs, is a recently developed grasshopper suppression method in which the rate of insecticide is reduced from conventional levels, and treated swaths are alternated with swaths that are not directly treated. The RAATs strategy relies on the effects of an insecticide to suppress Mormon crickets within treated swaths while conserving Mormon cricket predators and parasites in swaths not directly treated. Either carbaryl, diflubenzuron, or malathion would be considered under this alternative at the following application rates:

- 8.0 fluid ounces (0.25 lb a.i.) of carbaryl spray per acre;
- 10.0 pounds (0.20 lb a.i.) of 2 percent carbaryl bait per acre;
- 0.75 fluid ounce (0.012 lb a.i.) of diflubenzuron per acre; or
- 4.0 fluid ounces (0.31 lb a.i.) of malathion per acre.

The area not directly treated (the untreated swath) under the RAATs approach is not standardized. In the past two years, the area that remains untreated within a treatment block has ranged from 80 to >99% percent in Idaho. The 2002 EIS analyzed the reduced pesticide application rates associated with the RAATs approach but assumed pesticide coverage on 100 percent of the area as a worst-case assumption. The reason for this is there is no way to predict how much area will actually be left untreated as a result of the specific action requiring this EA. This Alternative would treat up to 50% of the land surface within a treatment block. Rather than suppress Mormon cricket populations to the greatest extent possible, the goal of this alternative is to suppress Mormon cricket populations to a level that preserves a balance of resources.

The potential environmental effects of application of carbaryl, diflubenzuron, and malathion under this alternative are discussed in detail in the 2002 EIS (Environmental Consequences of Reduced Agent Area Treatments (RAATs), pp. 49–57). A description of anticipated site-specific impacts from this proposed treatment may be found in Part V of this document.

D. Modified Reduced Agent Area Treatments (RAATs) Alternative (Preferred Alternative)

Alternative D combines the RAATs approach explained in Alternative C with the 5% rate of carbaryl bait explained in Alternative B and eliminates the carbaryl and malathion spray components included in Alternatives B and C. Either carbaryl bait or diflubenzuron spray would be considered under this alternative at the following application rates:

- 10.0 pounds (0.50 lb a.i.) of 5 percent carbaryl bait per acre;
- 10.0 pounds (0.20 lb a.i.) of 2 percent carbaryl bait per acre; or
- 0.75 fluid ounce (0.012 lb a.i.) of diflubenzuron per acre.

The 0.20 lb a.i. rate of carbaryl bait was assessed in the 2002 EIS primarily as a tool for grasshopper control. Although that rate may be sufficient for suppression of some species of grasshoppers in some situations, the very heavy Mormon cricket populations encountered in the current Idaho outbreaks would often require the 0.50 lb a.i. rate.

Aerial applications of bait or spray would be made to no more than 50% of the land area within any specific treatment block (treat one swath and skip one swath), and would usually be made to 20% of the land area within any specific treatment block (treat one swath and skip four swaths). Thus the assessments of potential environmental impacts discussed in the 2002 EIS (5% carbaryl bait pp. 39-42; 2% carbaryl bait and 0.75 fluid ounce diflubenzuron pp. 50-55) are based on treatment rates 2X to 5X of those that would actually be applied under this alternative.

Ground applications of bait would be made to no more than 50% of the land area within any specific treatment block, and may be made to as little as <1% of the land area within any specific treatment block. Ground applications would normally be made to existing roadsides and trailsides, but might be made off roads or trails with the concurrence of land managers.

III. Methodologies

These methodologies would apply to Alternatives B, C, and D.

A. Land Administration

As provided by the Plant Protection Act, APHIS would conduct Mormon cricket suppression programs on federal lands in response to requests of the administering agency. Over the past two decades, most of the suppression programs conducted by APHIS in Idaho have been on lands administered by BLM. Smaller amounts of National Forest System lands have been treated in some years. Although APHIS is authorized to treat state and private rangeland under the Plant Protection Act, the restrictions under which USDA must operate

have deterred state and private land mangers from seeking cooperative programs in Idaho.

Bureau of Land Management
APHIS would treat severe Mormon cricket outbreaks on public lands administered by the BLM in Idaho when treatments are necessary and can be effective in minimizing private and public resource impacts. APHIS would evaluate site specific complaints, develop proposed treatment strategies consistent with the program and protection measures documented in this EA, and implement specific control or suppression actions. The Mormon cricket suppression program for BLM managed public lands in Idaho would be anticipated primarily for crop protection where private lands are within close proximity to BLM managed rangeland, and where economic damage is occurring or, is expected to occur. Treatments might also be necessary to protect high value rangeland resources, native plant community restoration projects, watersheds, recreational areas, communities, or other resources when threatened by severe infestations. All treatments would be designed to minimize the size of treated areas and would incorporate appropriate measures to protect resource values while maintaining treatment effectiveness. These suppression measures might be conducted either by ground or aerial applications.

Forest Service
APHIS would treat severe Mormon cricket outbreaks on National Forest System lands administered by FS in Idaho when treatments are necessary and can be effective in minimizing private and public resource impacts. APHIS would evaluate site specific complaints, develop proposed treatment strategies consistent with the program and protection measures documented in this EA, and implement specific control or suppression actions. The Mormon cricket suppression program for National Forest System lands in Idaho would be anticipated primarily for crop protection where private lands are within close proximity of National Forest System Lands, and where economic damage is occurring or, is expected to occur. Treatments might also be necessary to protect high value rangeland resources, native plant community restoration projects, watersheds, recreational areas, communities, or other resources when threatened by severe infestations. All treatments would be designed to minimize treated areas and would incorporate appropriate measures to protect resource values while maintaining treatment effectiveness. These treatment and suppression measures might be conducted either by ground or aerial applications.

B. Documenting Rangeland Mormon cricket Suppression Programs
APHIS would document complaints from public land mangers, private landowners and other persons with the protocol included as Appendix 4. APHIS would document evaluations, recommendations regarding treatments, and the conduct of treatments with the protocol included as Appendix 4. When APHIS would make a recommendation for a specific treatment block, it would be

incumbent on the land manger to determine if the recommendation should be modified to:

Exclude any sensitive areas that APHIS had included in the proposed treatment block;

Include additional critical areas that APHIS had not specified; or

Modify the percentage of the treatment block which receives direct treatment under RAATs.

The land manager would certify that the proposed treatment, including any modifications, was consistent with the provisions of the EA.

C. Treatment Strategy

The treatment block would consist of a parcel of rangeland infested by a Mormon cricket outbreak. The entire treatment block would not be treated. The surface area to which insecticides would be applied within a treatment block would range from 1% to 50% of the total block. No contiguous strip greater than 300 feet wide would ever be treated.

1. Basis for decision to treat

Several factors are included in the threat assessments. The first level of assessment is the overall Mormon cricket population density. This is determined through field survey and is expressed in Mormon crickets per square yard. The age composition of a Mormon cricket population determines how much feeding damage would be done before the end of the growing season. The migratory status of Mormon cricket bands determines if they would invade areas where resources need to be protected. Treatments might be necessary to protect high value rangeland resources, native plant community restoration projects, watersheds, recreational areas, communities, or other resources when threatened by severe infestations.

2. Multiple applications

No area would be treated more than once during a year under this EA and/or any grasshopper EAs which cover the same areas.

3. Methods of application

Insecticides would be applied in swaths which have a width determined for each treatment device (aircraft, truck-mounted spreader, or ATV-mounted spreader). For instance, an Ayres Turbine Thrush aircraft can deliver a 100 foot swath and an ATV-mounted bait spreader may deliver a swath up to 40 feet wide with carbaryl bait. Swaths delivered by aircraft are parallel to one another, and swaths delivered by ground equipment are dependent on the accessibility of the terrain. Distance between swaths allows computation of the percentage of the treatment block that actually receives direct treatment. In 2003 and 2004, APHIS received a

Notice of Intent to Sue for alleged violation of the Clean Water Act. The basis for these notices was that APHIS did not have an National Pollution Discharge Elimination System (NPDES) permit. On February 1, 2005, EPA published a Proposed Rule to codify guidance that an NPDES permit is not required for spray programs like the Mormon cricket suppression program.

4. Protective Measures in Addition to Those Included in FY 2006 Guidelines (Appendix 1)

Appendix 1 includes protective measures which would be used in all APHIS Mormon cricket suppression programs, nationwide. Following are additional measures which would be implemented in Idaho:

Insecticide application rates would be reduced below EPA maximum allowable rates.

Treatment blocks would not receive full area coverage. 50% to >99% of each treatment block would not receive direct application of insecticide.

Aerial applications of carbaryl bait would not be made within 500 feet of water.

APHIS would perform on-site examination of proposed treatment blocks to determine the presence of water.

Biological control agent release sites would be considered on an individual basis in consultation with the land manager to determine if insecticide might be used and/or how much buffer space should be allowed.

No aerial application would be made within ½ mile of crops enrolled in the Idaho Certified Organic Crop Program except on the request of the organic farm manager. APHIS may decline to apply any treatments which were requested inside this buffer area. APHIS develops buffers which will assure that unintended consequences of pesticidal applications are avoided. In most cases, the buffers are sized to prevent potentially toxic levels of the insecticide from reaching a sensitive site. In the case of organic crops, any detectable residue could have a deleterious impact on the certification of the crop.

If insecticide labeling requires a re-entry period after treatment, APHIS would post or continuously patrol treated areas to insure that nobody entered a treated area within the timeframe required by EPA under Fungicide and Rodenticide Act (FIFRA) for re-entry after treatment.

APHIS would make available a mechanism whereby individuals can request that federally managed rangelands around or adjacent to their private property would be excluded from treatments for Mormon crickets. The request form is available at:

http://www.agri.state.id.us/Categories/PlantsInsects/GrasshopperMormonCricketControlProgram/Documents/FormsPublicationsReports/Nosprayrequest%20_2005.pdf.
It is also available at many County Extension Offices, BLM Offices and Forest Service Offices. It is also available from APHIS in Boise. Requests for the form may be sent to USDA APHIS PPQ, 9134 West Blackeagle Drive, Boise ID 83709 or faxed to 208-378-5794.

Treatments within special management areas of the BLM Owyhee Field Office would be permitted for cricket treatment. However, application methods are required to be conducted in accordance with the management guidelines which are outlined within the 1999 Owyhee Resource Management Plan and the Wilderness Study Area (WSA) Interim Management Policy (IMP) document *H-8550-1 Interim Management Plan for Lands Under Wilderness Review dated 7/5/1995*. Prior to application APHIS would coordinate with the Owyhee Field Manager to ensure that application methods (off-road vehicle use, etc.) would be in accordance with BLM policy for WSAs, ACECs, and RNAs

Within the Bruneau BLM Field Office area, treatments within the proposed Biological Soil Crusts ACEC would be limited to aerial bait application. Motor vehicle use for land-based control applications will conform to field office OHV designations. If non-conforming vehicle use was desired (for example, cross-country ATV travel in limited or closed areas), site specific advance permission from the authorized officer would be required.

IV. Affected Environment

A. Description of Affected Environment

It is not generally possible to predict the precise locations where Mormon cricket outbreaks and migrations will occur in any given year. In 2005 approximately 733,100 acres of federally managed rangeland in Idaho were infested with heavy populations of Mormon crickets. This is down from 1.9 million acres in 2004. Because APHIS cannot be sure where migration and spread of the infestations will occur, it is necessary to include an expanded area in the EA. The proposed suppression program area specified in this EA includes virtually all areas which might host outbreaks that would require suppression. The proposed suppression area is therefore, approximately 5,106,309 acres before subtraction of sensitive areas including buffers around water, and other sites. APHIS estimates that no more than 10% of this area would be included in treatment blocks and maximum area treated within a block would vary between one and 50%.

A large outbreak of Mormon crickets has been building for several years in the Boise foothills, the Danskin Mountain area and the Bennett Hills in Ada, Boise, and Elmore Counties. The outbreak now extends west and north into the

watersheds of the Payette and Weiser Rivers in Adams, Gem, Payette, Valley and Washington Counties; and east into rangeland in Gooding and Camas Counties. In 2005, this outbreak decreased in intensity on the eastern end and expanded slightly on the western end. A total of 357,000 acres were infested with outbreak populations in 2005.

The outbreak in Owyhee County stretched from Murphy to Triangle in 2003. The outbreak expanded west into Oregon, south beyond Mud Flat and east across Poison Creek in 2004; growing from 19,000 to 1.6 million acres. In 2005 the acreage with high cricket populations decreased to 290,000 acres.

Another outbreak increased in intensity during 2005 in Oneida, Bannock, and Power Counties with 86,000 acres showing high populations.

2005 Outbreaks are depicted in the maps found in the 2005 Annual Report which is available at:
http://www.agri.state.id.us/Categories/PlantsInsects/GrasshopperMormonCricketControlProgram/ghprogramenvirodocs_pubs_reports.php. Requests for the report may also be sent to USDA APHIS PPQ, 9134 West Blackeagle Drive, Boise ID 83709 or faxed to 208-378-5794.

The proposed program area included in this EA includes federally managed rangeland in southern Idaho described as follows.

SOUTHEAST IDAHO
Bannock County
BLM managed rangeland south and east of Pocatello. Caribou National Forest Lands around Scout Mountain. Total area under consideration 180,405 acres.

Cassia County
BLM managed rangeland and Sawtooth National Forest Lands in T10S R29E, T11S R29E, T12S R29E, T13S R29E, T14S R29E, and T15S R29E. Total area under consideration 83,880 acres.

Franklin County
Caribou National Forest Lands west of Dayton and Oxford. BLM managed lands in the northern part of the county. Total area under consideration 30,955 acres.

Oneida County
BLM managed rangeland in areas around Samaria Mountain, Quaking Mountain, and lands west of Malad City and Daniels. Caribou National Forest Land in the Malad Range and east of Daniels. Curlew National Grassland. Total area under consideration 406,449 acres.

Power County
BLM managed rangeland in the Deep Creek Mountains, on the east side of Arbon Valley, and in the Sublett Range. Sawtooth National Forest Land in the Sublett Range. Total area under consideration 217,452 acres.

SOUTHWEST IDAHO
Ada County
BLM managed rangeland and Boise National Forest Lands on the Boise front. Total area under consideration 33,359 acres.

Adams County
BLM managed rangelands and Payette National Forest Lands in the Weiser River watershed. Total area under consideration 262,526 acres.

Boise County
BLM managed rangeland near Horseshoe Bend and Banks. Boise National Forest Lands on Boise Ridge and Mount Heinen. Total area under consideration 197,909 acres.

Camas County
BLM managed rangeland in the Bennett Hills. Total area under consideration 95,525 acres.

Elmore County
BLM managed rangeland north of Interstate 84. Boise National Forest Lands on Danskin Mountain, House Mountain, Krall Mountain, and Lava Mountain. Total area under consideration 615,947 acres.

Gem County
BLM managed rangeland north and south of Emmett. Total area under consideration 119,507 acres.

Gooding County
BLM managed rangeland in the Bennett Hills north of Interstate 84. Total area under consideration 246,962 acres.

Owyhee County
BLM managed lands west of Highway 51. Total area under consideration 2,324,384 acres.

Payette County
BLM managed rangeland east of Payette. Total area under consideration 40,004 acres.

Valley County
Payette National Forest Lands on West Mountain. Total area under consideration 45,724 acres.

Washington County
BLM managed rangeland and Payette National Forest Lands in the Weiser watershed. BLM managed rangeland in the eastern portion of the county in T10N R1E, T10N R1W, T10N R2W, T11N R1E, T11N R1W, T11N R2W, T12N R1E, T12N R1W, T12N R2W, T13N R1E, T13N R1W. Total area under consideration 205,314 acres.

Maps of the described areas are in Appendix 2.

General Description
The area lies within the Interior Columbia Basin. Landforms consist primarily of valleys bordered by north-south running mountain ranges. Numerous impoundments on the Snake River and its tributaries serve multipurpose use. Irrigation systems serve agricultural areas throughout the region. Except for the Snake River and its major tributaries, most streams in the area are generally intermittent. There are some small streams which are perennial. Major tributaries of the Snake River that traverse proposed program areas include: Portneuf River and Rock Creek in southeast Idaho and the Boise, Weiser and Payette Rivers in southwest Idaho.

Events during the Pleistocene shaped much of Idaho's landscape. In the southern portions of Idaho, repeated overflows of historic Lake Bonneville into the Snake River modified the Snake River Valley. In addition to the volcanic flows, sedimentary deposits including glacial till, outwash and loess, and valley fill, terraces, and scour features are present over much of the area. Soils in the Snake River Plains developed from loess deposits and this has enabled these areas to become highly productive agricultural areas. Intensive livestock production systems such as dairies, feedlots, and trout farms create demand for feed which is partially supplied locally by alfalfa, corn, and wheat fields. Potatoes, sugar beets, and grain are other primary crops produced within the area. Annual cash farm receipts in Idaho average about $1.78 billion from crops and and $2.12 billion from livestock. Total receipts from farm marketing in 2002 were $3.91 billion.

Grassland and shrubland are present across the general area. Forest lands are present at higher elevations. Mormon cricket treatments would occur only in grass and shrublands, not in forests.

The plains and foothills are semi-arid sagebrush steppe. Summers are hot and winters are moderate. Average annual temperature is 40 to 55 °F. Total annual precipitation averages 5 to 20 inches; almost no rain falls during the summer months. Examples of probability of 0.50" of precipitation in a 24 hour period

April 15 to August 15 (Western Regional Climate center, http://www.wrcc.dri.edu) are:

Cambridge	0 to 5%
Mountain Home	0 to 2%
Malad	0 to 4%
Silver City	0 to 9%

The rangelands are primarily shrub steppe and are utilized for cattle and sheep grazing. They provide habitat for native and introduced game and non-game animal species. They are in an accelerated state of ecological change due to invasion by exotic plant species, changes in fire patterns, and intervention by humans.

Elevation and topography within the overall area vary considerably, from 2,000 to near 10,000 feet, and from flat plains to steep mountain ranges. Treatments would occur on mountains, foothills and flatlands, usually near cropland and hayfields. Some treatments could occur on remote blocks of rangeland where critical forage or revegetation projects or recreational resources are threatened by Mormon crickets.

BLM manages rangelands within the Idaho Falls, Twin Falls and Boise Districts. FS manages rangelands within Boise, Sawtooth, Caribou, and Payette National Forests and the Curlew National Grasslands

Larger towns or cities near the federally managed rangelands include Pocatello, Mountain Home, and Boise. The Fort Hall and Duck Valley Indian reservations occur in or near the program area. The Deer Flat National Wildlife Refuge and the Snake River Birds of Prey National Conservation Area are within or near the area. The Minidoka National Wildlife Refuge and City of Rocks National Reserve are within or near the area.
Areas specifically excluded are:

1. Those rangeland areas in the watersheds which drain into the Snake River downstream from Brownlee Dam. APHIS has not completed consultation with National Oceanic and Atmospheric Administration Fisheries regarding measures to protect endangered salmon and steelhead. Therefore APHIS would not include watersheds which are involved with those species.

2. Snake River Birds of Prey National Conservation Area including the Ted Trueblood Wildlife Area.

3. The Mulford's milkvetch proposed Area of Critical Environmental Concern (ACEC) near Grand View.

4. The Mud Flat Oolite ACEC and the proposed expansion to the Mud Flat Oolite ACEC.

5. Within the area managed by Four Rivers Field Office of BLM, no treatment will be allowed in ACECs unless specifically listed below.

Treatment in the Long-billed Curlew Habitat ACEC will only be considered after July 15 on a case-by-case basis. Ground treatment would be limited to existing roads and trails.

Treatment in the Boise Front ACEC will only be considered on a case-by-case basis. Ground treatment would be limited to existing roads and trails.

Treatment in the Columbian Sharp-tailed Grouse ACEC will only be considered on a case-by-case basis. No treatment will be permitted during sharp-tailed early brood rearing. Ground treatment would be limited to existing roads and trails.

6. Areas between the canyon rims of Jump Creek Canyon ACEC and the Boulder Creek ONA.

7. Other ACECs will be considered separately on a case by case basis at stage 2 of the process. Considerations would include all relevant management plans and management policies.

8. Wilderness Study Areas (WSA) and Designated Resource Natural Areas (DRNA) will be excluded from consideration for treatments except for those within the Owyhee Field Office of BLM which will be considered on a case by case basis.

9. Owyhee River Bighorn Sheep Habitat Area and the Tules Research Natural Area (RNA) will not be considered for treatment if crickets are reported within these areas.

10. Other areas which are specifically identified in this EA because of their association with sensitive species or other sensitive sites.

B. Site-Specific Considerations

1. Human Health

The suppression program would be conducted on federally managed rangelands that are not inhabited by humans. Human habitation may occur on the edges of the rangeland. Most habitation is comprised of farm or ranch houses, but some rangeland areas may have suburban developments or "ranchettes" nearby.

Average population density in rural areas of Idaho is 6.3 persons per square mile. Recreationists may use the rangelands for hiking, camping, bird watching, hunting, falconry or other uses. Ranchers and sheepherders may work on the rangelands on a daily basis.

Individuals with allergic or hypersensitive reactions to insecticides may live near or may utilize rangelands in the proposed suppression program area.

Entomophobic individuals may live near or may utilize rangelands in the proposed suppression area. Entomophilic individuals may live near or utilize rangelands in the proposed suppression area.

Some rural schools may be located in areas near the rangeland which might be included in treatment blocks. Children may visit areas near treatment blocks or may even enter treatment blocks before or after treatments. It has been suggested that children might consume bait formulations of insecticide.

2. Nontarget Species

Nontarget species within the suppression program area include terrestrial vertebrate and invertebrate animals, aquatic organisms, and terrestrial plants (both native and introduced).

Invertebrate organisms of special interest include biocontrol agents and pollinators. Land managers and others have released and managed biocontrol agents including insects and pathogens on many species of invasive plants within and near the suppression program area. These biocontrol agents are important in decreasing the overall population or the rate of reproduction of some species of undesirable rangeland plants, especially exotic invasive weeds.

Pollinators including insects and other organisms occur within and near the suppression program area. Pollinators include managed exotic and native insect species such as honey bees, leafcutter bees, and alkali bees which are commercially valuable for agriculture. Other species of insects and other animals pollinate native and exotic plants and are necessary for the survival of some species.

Vertebrates include highly visible introduced and native mammalian species such as cattle, sheep, horses, mule deer, elk, pronghorn, coyotes and wolves as well as smaller animals like rabbits, mice, gophers and bats. Birds comprise a large portion of the vertebrate species complex, and they also include exotic and native species. Some exotic game birds, like pheasant and partridge, have been deliberately introduced into the area, and other species such as starlings and pigeons have spread from other loci of introduction. Sage obligate bird species, typified by sage grouse, are present in much of the area. Various reptiles and amphibians are also present. Many of the herbivorous vertebrate species compete

with Mormon crickets for forage. Many of the vertebrate species utilize Mormon crickets and other insects as a food source. There is special concern about the role of Mormon crickets as a food source for sage grouse, sharp-tailed grouse, and other bird species.

The proposed suppression area contains a vast variety of terrestrial invertebrates, primarily insects and other arthropods. They include species which compete with Mormon crickets and some which prey on Mormon crickets. In turn Mormon crickets may prey opportunistically on other invertebrates.

Aquatic organisms within the suppression area include plants and vertebrate and invertebrate animals. Some species of fish utilize Mormon crickets as a significant food source during some parts of the year.

A diverse complement of terrestrial plants occurs within the proposed suppression area. Many such as rush skeletonweed, purple loosestrife, spotted and diffuse knapweed, downy brome, and leafy spurge are invasive weeds. Others, such as crested wheatgrass have been planted for rehabilitation purposes. Native plants such as sagebrushes, bitterbrush, and various grasses provide forage and shelter for animal species and help stabilize the soil against erosion.

Biological soil crusts, also known as cryptogamic, microbiotic, cryptobiotic, and microphytic crusts, occur within the proposed suppression area. Biological soil crusts are formed by living organisms and their by-products, creating a crust of soil particles bound together by organic materials. Crusts are predominantly composed of cyanobacteria (formerly blue-green algae), green and brown algae, mosses, and lichens. Liverworts, fungi, and bacteria can also be important components. Crusts contribute to a number of functions in the environment. Because they are concentrated in the top one to four mm of soil, they primarily effect processes that occur at the land surface or soil-air interface. These include soil stability and erosion, atmospheric N-fixation, nutrient contributions to plants, soil-plant-water relations, infiltration, seedling germination, and plant growth.

Federally listed threatened and endangered species which might occur in or near the proposed suppression area include:

Gray wolf (Ada, Adams, Bannock, Boise, Camas, Cassia, Elmore, Franklin, Gem, Gooding, Oneida, Owyhee, Payette, Power, Valley, Washington),

Canada lynx (Adams, Boise, Camas, Elmore, Franklin, Valley),

Bald eagle (Ada, Adams, Bannock, Boise, Camas, Cassia, Elmore, Franklin, Gem, Gooding, Oneida, Owyhee, Payette, Power, Valley, Washington),

Banbury Springs lanx (Gooding),

Bliss Rapids snail (Cassia, Elmore, Gooding, Owyhee, Power)
Snake River physa (Cassia, Elmore, Gooding, Owyhee),

Utah valvata snail (Bannock, Camas, Cassia, Gooding, Power),

Idaho springsnail (Elmore, Gooding, Owyhee, Payette, Washington)

Bull trout (Ada, Adams, Boise, Camas, Elmore, Gem, Owyhee, Payette, Valley, Washington),

Northern Idaho ground squirrel (Adams, Valley, Washington)

Areas where proposed critical habitat for bull trout may be within or near the proposed suppression area include parts of Ada, Adams, Boise, Camas, Elmore, Gem, Payette, Valley and Washington Counties.

Slickspot peppergrass was proposed for federal endangered species status in Ada, Boise, Elmore, Gem, Owyhee, and Payette counties. The proposal was withdrawn January 22, 2004, and a Candidate Conservation Management Agreement was developed. On August 19, 2005, a court order granted summary judgment reversing the withdrawal.

Discussion of these species is included in V.B.5

Many other species are accorded special status by federal land managers or by the State of Idaho. Data about these species are available from the respective land managers or at http://www2.state.id.us//fishgame/info/cdc/cdc.htm.

3. Socioeconomic Issues
Local economies in the areas near most proposed suppression areas are driven primarily by agricultural production, processing, and marketing concerns. Major employers in southern Idaho include Albertsons, Inc.; Fred Meyer, Inc.; Hewlett-Packard Co.; Idaho Power Co.; J.R. Simplot Co.; Micron Technology, Inc.; Potlach Corp; St. Alphonsus Regional Medical Center; St. Luke's Regional Medical Center; and Wal-Mart. These businesses roughly divide into those which have headquarters, factories or service centers located in the Boise metropolitan area and those which support agricultural and natural resource enterprises or provide retail trade in the rural areas.

Livestock enterprises include rangeland grazing by cattle and sheep, feedlots for beef, and concentrated dairy operations. Local processing which adds value to livestock production systems includes meat packing houses, and cheese plants.

Farmers in areas near proposed suppression areas grow feed for the dairies and feedlots. This includes alfalfa and corn. They also grow potatoes, sugarbeets, wheat, barley, sweet corn, beans, and a variety of other crops. Potato and sugarbeet processing plants add value in several of the rural communities. In

some areas near the proposed suppression area, growers produce seed of flowers and various forage, feed, and vegetable crops. The seed crops are often of exceptionally high value per acre compared to crops for consumption.

Acreage in organic production has decreased in the area near proposed suppression areas. There were 50,800 acres registered in organic production in Idaho in 2003. This includes feed for organic dairies and various other organic crops.

Beekeepers maintain hives to produce honey and other bee products on land which is included in the proposed treatment area as well as on land located near the proposed treatment area. Seed crops and fruit crops rely on pollination from bees which may live or forage on or near proposed suppression areas.

The general public uses federally managed rangelands in the proposed suppression area for a variety of recreational purposes including hiking; camping; wildlife, bird, and insect collecting and watching; hunting; falconry; shooting; plant collecting; rock and fossil collecting; artifact collecting; sightseeing; and dumping. Members of the general public traverse rangelands in or near the proposed suppression area on foot, horseback and other beasts of burden, all terrain vehicles, bicycles, motorcycles, four-wheel drive vehicles, snowmobiles, aircraft, and balloons.

Artificial surfaces in or near the proposed suppression area include the walls and roofs of buildings, painted finishes on automobiles, trailers, recreational vehicles, and road signs. See 2002 EIS pp 71-72.

Esthetic values of the natural environment in the suppression area include the views, vistas, diversity of the biota, and the opportunity to commune with nature in isolated settings. Many stakeholders have expressed extremely strong opinions regarding the esthetics of the natural environment.

4. Cultural Resources and Events

Cultural and historical sites include locations and artifacts associated with Native Americans, explorers, pioneers, religious groups and developers. Native American petroglyphs have been discovered in several areas within the proposed suppression area. Artifacts from knapping occur within the proposed suppression area. Elements of the Oregon and California Trails transect portions of the proposed suppression area, and monuments have been erected in several places. Museums, displays and structures associated with mining, logging, and irrigation development exist in areas near the proposed suppression area.

5. Special Considerations for Certain Populations

a. Executive Order No. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order (E.O.) 12898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, was signed by President Clinton on February 11, 1994 (59 *Federal Register* (FR) 7269). This E.O. requires each Federal agency to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. Consistent with this E.O., APHIS will consider the potential for disproportionately high and adverse human health or environmental effects on minority populations and low-income populations for any of its actions related to Mormon cricket suppression programs.

Population makeup in Idaho (U.S. Census Bureau 2000) is 91% White. Hispanic or Latino of any race is the next most numerous group comprising 7.9 %. Other identifiable groups include Black or African American 0.4%, American Indian and Alaska Native 1.4 %, Asian 0.9%, and Native Hawaiian and Other Pacific Islander 0.1%. Of the minority groups, Hispanic and Asian appear to be the groups with most involvement in agriculture. Hispanic workers are often engaged in production and processing of crops. Sheepherding is a profession which currently engages persons of Peruvian nationality or descent. Persons of Asian descent are frequently involved in crop production and processing.

County	2003 Population Estimate	Percentage Minority Population 2000 census data
Ada	325,151	7.1%
Adams	3,515	3.7%
Bannock	75,630	8.7%
Boise	7,236	4.8%
Camas	1,049	4.8%
Cassia	21,610	15.3%
Elmore	28,872	14.6%
Franklin	11,874	4.9%
Gem	15,795	6.2%
Gooding	14,329	12.4%
Oneida	4,132	2.5%
Owyhee	11,186	23.1%
Payette	21,466	9.7%
Power	7,373	16.2%
Valley	7,743	3.6%
Washington	9,995	12.4%

Figures for Idaho put 8.3% of the families and 11.8% of the individuals in the state below the poverty level in 1999. Median family income was estimated at $44,022 and per capita income at $17,336 in 2000.

County	2003 Population Estimate	Percentage Below Poverty 1999
Ada	325,151	7.7%
Adams	3,515	15.1%
Bannock	75,630	13.9%
Boise	7,236	12.9%
Camas	1,049	8.3%
Cassia	21,610	13.6%
Elmore	28,872	11.2%
Franklin	11,874	7.4%
Gem	15,795	13.1%
Gooding	14,329	13.8%
Oneida	4,132	10.8%
Owyhee	11,186	16.9%
Payette	21,466	13.2%
Power	7,373	16.1%
Valley	7,743	9.3%
Washington	9,995	13.3%

b. Executive Order No. 13045, Protection of Children from Environmental Health Risks and Safety Risks

The increased scientific knowledge about the environmental health risks and safety risks associated with hazardous substance exposures to children and recognition of these issues in Congress and Federal agencies brought about legislation and other requirements to protect the health and safety of children. On April 21, 1997, President Clinton signed E.O. 13045, Protection of Children From Environmental Health Risks and Safety Risks (62 FR 19885). This E.O. requires each Federal agency, consistent with its mission, to identify and assess environmental health risks and safety risks that may disproportionately affect children and to ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. APHIS has developed agency guidance for its programs to follow to ensure the protection of children (USDA, APHIS, 1999).

Individuals under 18 years of age comprised 28.5% of the population in Idaho in 2000.

Populations and percentages of individuals under age 18 by counties:

County	2003 Population Estimate	Percentage Under Age 18 2000
Ada	325,151	27.3%
Adams	3,515	23.9%
Bannock	75,630	28.1%
Boise	7,236	26.9%
Camas	1,049	24.7%
Cassia	21,610	34.1%
Elmore	28,872	28.0%
Franklin	11,874	37.3%
Gem	15,795	28.0%
Gooding	14,329	29.6%
Oneida	4,132	32.0%
Owyhee	11,186	31.9%
Payette	21,466	30.6%
Power	7,373	33.8%
Valley	7,743	23.7%
Washington	9,995	27.4%

Children under six months of age may have greater susceptibility to carbaryl than older individuals because they have immature livers and incompletely developed acetyl cholinesterase systems (2002 EIS B-28). It has been suggested that children might pick up and eat carbaryl bait.

Infants under three months of age have higher levels of methemoglobin than do older children and adults. Therefore, they may be at increased risk of methemoglobinemia if exposed to diflubenzuron.

The low frequency with which infants are present on rangelands; the low density of carbaryl bait in the environment (approximately one pellet per two square feet); the difficulty of finding bait pellets on the ground; and the low application rate of diflubenzuron make the likelihood of exposure and toxic consequences negligible.

V. Environmental Consequences

Each alternative described in this EA potentially has adverse environmental effects. The general environmental impacts of each alternative are discussed in detail in the 2002 EIS. The specific impacts of the alternatives are highly dependent upon the particular action and location of infestation. The principal concerns associated with the alternatives are: (1) damage to crops and natural resources caused by Mormon cricket outbreaks; (2) the potential effects of insecticides on human health (including subpopulations that might be at increased risk); and (3) impacts of insecticides on nontarget organisms (including threatened and endangered species). Assessments of

the relative risk of each insecticide option are discussed in detail in the 2002 EIS document.

A. Environmental Consequences of the Alternatives

Site-specific environmental consequences of the alternatives are discussed in this section.

1. No Action Alternative

Under this alternative, APHIS would not fund or participate in any program to suppress Mormon crickets. If APHIS does not participate in any Mormon cricket suppression program, Federal land management agencies, State agriculture departments, local governments, or private groups or individuals, may not effectively combat outbreaks in a coordinated effort. In these situations, Mormon cricket outbreaks could develop and spread unimpeded.

Loss of plant cover could occur due to consumption by Mormon crickets. Nesting and cover habitat may be degraded for birds and other wildlife. The herbaceous understory is important to nesting success by sage grouse (Connelly, et. al. 1994). Susceptibility to invasion by nonnative plants is a consequence that would likely occur should existing vegetation be removed by Mormon crickets. Plant cover may protect the soil from the drying effects of the sun, and plant root systems hold the soil in place that may otherwise be eroded.

Mormon crickets in unsuppressed outbreaks would consume agricultural and nonagricultural plants. The damage caused by Mormon cricket outbreaks could also pose a risk to rare, threatened, or endangered plants that often have a low number of individuals and limited distribution. Plants can be killed or weakened by Mormon cricket feeding. Some Mormon crickets feed on seeds, so future generations of plants could be threatened.

Mormon crickets are fairly omnivorous creatures. In Idaho, they do not only feed on live plants, but they also commonly feed on cow manure and the bodies of recently killed animals including snakes, toads and birds. These insects are well known to be cannibalistic and also feed on other insects. They may pose a risk to fledgling birds, as well. La Rivers (1944) reported a nest of half-grown Brewers sparrows devoured by a swarm of crickets. Mormon crickets feed on fungi (Pfadt 1994) so may pose a threat to biological soil crusts.

If APHIS does not participate in any Mormon cricket suppression programs, local governments, or private groups or individuals may attempt to conduct widespread Mormon cricket programs. Without the technical assistance and program coordination that APHIS can provide to Mormon cricket programs, it

is possible that a large amount of insecticides, including those APHIS considers too environmentally harsh, could be applied, reapplied, and perhaps misapplied in an effort to suppress or even locally eradicate Mormon cricket populations. It is not possible to accurately predict the environmental consequences of the No Action alternative because the type and amount of insecticides that could be used in this scenario are unknown. However, APHIS is aware that in 2002 private parties applied furadan, malathion, carbaryl, and dimethoate for Mormon cricket and/or grasshopper control in Idaho.

Rangeland fires may be set by persons who desire suppression of the Mormon crickets. Action of this type has not been documented, but individuals have threatened to set fires to destroy Mormon cricket outbreaks that are not controlled.

Very dense bands of Mormon crickets can make roadways slick. It is not known whether any traffic accidents have been directly attributable to this phenomenon in Idaho, but public safety authorities posted warning signs because of Mormon crickets on Highway 55 between Eagle and Horseshoe Bend during the Mormon cricket outbreak of 2002- 2004. Mormon crickets also created slick road conditions on Interstate 84 at milepost 71 in 2002. There is some risk of personal injury or death due to automobile accidents caused by Mormon crickets on highways and roads.

A significant portion of the American public has a negative response to insects and some persons may be clinically diagnosed as Entomophobic. Mormon crickets are especially vexatious because of their large size, population densities and migratory habits. Residents in areas bordering rangeland in the Boise foothills and other areas of southwest Idaho have expressed strong negative psychological reactions to Mormon cricket infestations.

Persons who are entomophilic may have reduced levels of concern and increased enjoyment from experiencing the outbreaks for recreational or scientific purposes.

Some stakeholders have indicated in past years that they are opposed to any treatments on public rangelands because they believe treatments would disrupt ecosystems, create human health problems or give unfair economic advantage to agricultural interests. The anxiety levels of these stakeholders may be reduced if APHIS does not suppress Mormon cricket outbreaks.

If APHIS does not treat Mormon cricket outbreaks on rangeland, there is an increased probability of additional insecticidal treatments on crops which would be invaded by Mormon crickets. This would result in increased

exposure of farm workers, including members of minority populations, to insecticides with higher toxicity than carbaryl or diflubenzuron.

An abundant supply of Mormon crickets and other insects would be available as a food source for insectivorous animals. This includes birds and other animals which have been accorded sensitive species status by land managers and others.

Socioeconomic issues

There is a risk that Mormon cricket outbreaks on rangeland would decrease the availability of forage for cattle and sheep. If sheep and cattle grazing become unprofitable, there may be disproportionate impact on the sheepherding and cattle raising professions. Sheepherders often belong to minority population groups.

Unchecked movement of Mormon cricket outbreaks into crops would result in crop loss and additional expenditures for insecticidal control in the crop fields. Organic farmers may suffer significant losses if Mormon cricket outbreaks are not controlled on rangeland and emigrate to organic cropland.

Stakeholders have suggested that the federal government should compensate farmers for losses incurred when Mormon crickets emigrate from public rangeland into crops. USDA Risk Management Agency currently offers multiperil crop insurance which may compensate for losses due to insects if the policy holder utilizes appropriate pest control measures, but those measures fail. Normally, payment of such claims is on the basis of failure of pest control spray practices due to untimely rainfall or some other natural event. USDA Farm Service Agency may be able to offer low interest loans when disasters are declared for various reasons which can include grasshopper/Mormon cricket outbreaks. Skold and Davis (1995) proposed a rangeland grasshopper insurance program. No authority currently exists within USDA for such a program.

Cultural resources and events

Mormon crickets were a significant source of protein for indigenous North American people. They are no longer used in this country as a human food source except as a novelty or recreational experience. They are used for fish bait and for pet food. Selection of the No Action alternative would result in their abundant availability for these purposes.

Mormon cricket populations at outbreak levels on rangeland would decrease the recreational satisfaction of some people utilizing rangeland resources, primarily those who do not like insects. Mormon cricket populations at outbreak levels on rangeland would increase the recreational satisfaction of some people utilizing rangeland resources, primarily those who enjoy spectacular biological phenomena.

Artificial Surfaces
Mormon crickets can damage artificial surfaces by coating them with excrement and saliva and by chewing off flaking paint or other protuberances. There is a possibility that artificial surfaces might suffer some damage due to chewing by Mormon crickets.

2. Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative

Under Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative, APHIS would participate in Mormon cricket programs with the option of using one of the insecticides carbaryl, diflubenzuron, or malathion, depending upon the various factors related to the Mormon cricket outbreak and the site-specific characteristics. The use of an insecticide would occur at the conventional rates. APHIS would not apply more than a single treatment in an outbreak year to affected rangeland areas in an attempt to suppress Mormon cricket outbreak populations by a range of 35 to 98 percent, depending upon the insecticide used.

Carbaryl
Carbaryl is of moderate acute oral toxicity to humans. The mode of toxic action of carbaryl occurs through inhibition of acetylcholinesterase (AChE) function in the nervous system. This inhibition is reversible over time if exposure to carbaryl ceases. The Environmental Protection Agency (EPA) has classified carbaryl as "a possible human carcinogen" (EPA, 1993). However, it is not considered to pose any mutagenic or genotoxic risk.

Potential exposures to the general public from conventional application rates are infrequent and of low magnitude. These low exposures to the public pose no risk of direct toxicity, carcinogenicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity. The potential for adverse effects to workers is negligible if proper safety procedures are followed, including wearing the required protective clothing. Therefore, routine safety precautions are expected to provide adequate worker health protection.

Carbaryl is of moderate acute oral toxicity to mammals (McEwen *et al.*, 1996a). Carbaryl applied at Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative rates is unlikely to be directly toxic to upland birds, mammals, or reptiles. Field studies have shown that carbaryl applied as either ultra-low-volume (ULV) spray or bait at Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative rates posed little risk to killdeer (McEwen *et al.*, 1996a), vesper sparrows (McEwen *et al.*, 1996a; Adam *et al.*, 1994), or golden eagles (McEwen *et al.*, 1996b) in the treatment areas. AChE inhibition at 40 to 60 percent can affect

coordination, behavior, and foraging ability in vertebrates. Multi-year studies conducted at several grasshopper treatment areas have shown AChE inhibition at levels of no more that 40 percent with most at less than 20 percent (McEwen *et al.*, 1996a). Carbaryl is not subject to significant bioaccumulation due to its low water solubility and low octanol-water partition coefficient (Dobroski *et al.*, 1985).

Carbaryl will most likely affect nontarget insects that are exposed to ULV carbaryl spray or that consume carbaryl bait within the Mormon cricket treatment area. Field studies have shown that affected insect populations can recover rapidly and generally have suffered no long-term effects, including some insects that are particularly sensitive to carbaryl, such as bees (Catangui *et al.*, 1996). The use of carbaryl in bait form generally has considerable environmental advantages over liquid insecticide applications: bait is easier than liquid spray applications to direct toward the target area, bait is more specific to grasshoppers, and bait affects fewer nontarget organisms than sprays (Quinn, 1996).

Should carbaryl enter water, there is the potential to affect the aquatic invertebrate assemblage, especially amphipods. Field studies with carbaryl concluded that there was no biologically significant effect on aquatic resources, although invertebrate downstream drift increased for a short period after treatment due to toxic effects (Beyers *et al.*, 1995). Carbaryl is moderately toxic to most fish (Mayer and Ellersieck, 1986).

Diflubenzuron

The acute oral toxicity of diflubenzuron formulations to humans ranges from very slight to slight. The most sensitive indicator of exposure and effects of diflubenzuron in humans is the formation of methemoglobin (a compound in blood responsible for the transport of oxygen) in blood.

Potential exposures to the general public from Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative rates are infrequent and of low magnitude. These low exposures to the public pose no risk of methemoglobinemia (a condition where the heme iron in blood is chemically oxidized and lacks the ability to properly transport oxygen), direct toxicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity. Potential worker exposures are higher than the general public but are not expected to pose any risk of adverse health effects.

Because diflubenzuron is a chitin inhibitor that disrupts insects from forming their exoskeleton, organisms without a chitinous exoskeleton, such as mammals, fish, and plants are largely unaffected by diflubenzuron. In addition, adult insects, including wild and cultivated bees, would be mostly unaffected by diflubenzuron applications (Schroeder *et al.*, 1980; Emmett and Archer, 1980). Among birds, nestling growth rates, behavior data, and

survival of wild American kestrels in diflubenzuron treated areas showed no significant differences among kestrels in treated areas and untreated areas (McEwen *et al.*, 1996b). The acute oral toxicity of diflubenzuron to mammals ranges from very slight to slight. Little, if any, bioaccumulation of diflubenzuron would be expected (Opdycke *et al.*, 1982).

Diflubenzuron is most likely to affect immature terrestrial insects and early life stages of aquatic invertebrates (Eisler, 2000). While this would reduce the prey base within the treatment area for organisms that feed on insects, adult insects, including Mormon crickets, would remain available as prey items. Many of the aquatic organisms most susceptible to diflubenzuron are marine organisms that would not be exposed to rangeland treatments. Freshwater invertebrate populations would be reduced if exposed to diflubenzuron, but these decreases would be expected to be temporary given the rapid regeneration time of many aquatic invertebrates.

Malathion

Malathion is of slight acute oral toxicity to humans. The mode of toxic action of malathion occurs through inhibition of AChE function in the nervous system. Unlike carbaryl, AChE inhibition from malathion is not readily reversible over time if exposure ceases. However, strong inhibition of AChE from malathion occurs only when chemical oxidation results in formation of the metabolite malaoxon. Human metabolism of malathion favors hydroxylation and seldom produces much malaoxon.

Potential exposures to the general public from conventional application rates are infrequent and of low magnitude. These low exposures to the public pose no risk of direct toxicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity. Potential worker exposures are higher, but still have little potential for adverse health effects except under accidental scenarios. Therefore, routine safety precautions are expected to continue to provide adequate protection of worker health.

EPA has recently reviewed the potential for carcinogenic effects from malathion. EPA's classification describes malathion as having "suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential" (EPA, 2000). This indicates that any carcinogenic potential of malathion cannot be quantified based upon EPA's weight of evidence determination in this classification. The low exposures to malathion from program applications would not be expected to pose carcinogenic risks to workers or the general public.

Malathion is of slight acute oral toxicity to mammals. There is little possibility of toxicity-induced mortality of upland birds, mammals, or reptiles, and no direct toxic effects have been observed in field studies. Malathion is not directly toxic to vertebrates at the concentrations used for grasshopper

suppression, but it may be possible that sublethal effects to nervous system functions caused by AChE inhibition may lead directly to decreased survival. AChE inhibition at 40 to 60 percent can affect coordination, behavior, and foraging ability in vertebrates. Multi-year studies at several grasshopper treatment areas have shown AChE inhibition at levels of no more than 40 percent with most at less than 20 percent (McEwen *et al.*, 1996a). Field studies of birds within malathion treatment areas showed that, in general, the total number of birds and bird reproduction were not different from untreated areas (McEwen *et al.*, 1996a). Malathion does not bioaccumulate (HSDB, 1990; Tsuda *et al.*, 1989).

Malathion will most likely affect nontarget insects within a treatment area. Large reductions in some insect populations would be expected after a malathion treatment under Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative. While the number of insects would be diminished, there would be some insects remaining. The remaining insects would be available prey items for insectivorous organisms, and those insects with short generation times may soon increase.

Malathion is highly toxic to some fish and aquatic invertebrates; however, malathion concentrations in water, as a result of grasshopper treatments, are expected to present a low risk to aquatic organisms, especially those organisms with short generation times.

General
The implementation of pesticide label instructions and restrictions and the APHIS treatment guidelines will reduce potential impacts from the program use of insecticides (see Appendix 1 treatment guidelines).

Human exposure to insecticides would occur. Exposures and effects are discussed in the 2002 EIS pp. 39-40, 50, B10-B13, B22-B25, B51-B53. Potential exposures of the general public to insecticides are infrequent and of low magnitude under this alternative. These low exposures to the public pose no risk of direct toxicity, carcinogenicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity.

Personnel working on the suppression program would be exposed during handling, loading and application of the insecticides. Implementation of the Treatment Guidelines (Appendix 1.) would minimize public exposure and protect workers from harmful exposure. The potential for adverse effects to workers is negligible if proper safety procedures are followed, including wearing the required protective clothing. Therefore, routine safety precautions are expected to provide adequate worker health protection.

Individuals with hypersensitivity to the insecticides might be affected. APHIS would offer to compile a list of persons who wish to be listed and would either

avoid treating areas near their homes or would contact them prior to treatment. Hypersensitive individuals would be advised to avoid treatment blocks.

Some stakeholders have indicated that they are opposed to any treatments on public rangelands because they believe treatments would disrupt ecosystems, cause human health problems or provide an unacceptable advantage to agricultural interests. The anxiety levels of these stakeholders may be increased by adoption of this alternative versus the No Action Alternative.

Pesticide spills could expose individuals to excessive levels of insecticide. APHIS maintains spill kits and insures that program personnel are familiar with procedures to mitigate effects associated with a spill.

Entomophobic persons may have reduced anxieties vs. the No Action Alternative. Entomophilic persons may have increased anxieties vs. the No Action Alternative.

Non-target species

Aquatic

Insecticides have the potential to affect animals in aquatic ecosystems. Should they enter water, there is the potential to affect the aquatic invertebrate assemblage, especially amphipods. Field studies concluded that there was no biologically significant effect on aquatic resources, although invertebrate downstream drift increased for a short period after treatment due to toxic effects (Beyers *et al.* 1995). Fish are not likely to be affected at any concentrations that could be expected under this Alternative. Although the risk of contamination of water must be rated higher than under the No Action Alternative, untreated buffer areas around all water would prevent entry of toxic concentrations into the water. Insecticide concentrations in runoff waters are addressed in the EIS pg C-6. Under worst case scenarios, runoff from a storm intensity of one inch resulted in negligible concentration of insecticide in the runoff water. Probability charts generated by Western Regional Climate Center show that storm intensities of half that magnitude are extremely rare in the proposed project area.

Amphibians

Stakeholders have expressed concern about toxicity of pesticides to frogs in Owyhee County. Amphibians are relatively resistant to diflubenzuron (Eisler 1992). The acute oral LD_{50} of carbaryl to bullfrogs is greater than 4000 mg/kg (Hudson et al, 1984) indicating that carbaryl is slightly toxic to amphibians. The toxicity of malathion is relatively low to adult amphibians but is highly toxic to aquatic stages (EIS pg B-43). The EIS shows estimated daily doses and reference doses for Woodhouse's toad as follows under the full coverage alternative:

	Estimated dose (mg/kg)	Reference dose 1/5 LD_{50}	LD_{50}	Ref. Species
Diflubenzuron	16.56	752	3762	Red-winged blackbird
Carbaryl	62.95	156	780	Sharp-tailed Grouse
Malathion	74.02	30	150	Chicken

Mammals and birds

Stakeholders have expressed concern about chronic and acute toxicity of insecticides to birds on rangeland. These concerns were well founded for Mormon cricket control programs conducted throughout much of the 20th Century. Originally, inorganic insecticides were used, with a typical bran bait formulation incorporating 8 pounds of liquid sodium arsenite into 100 pounds of bran (Cowan 1929). For a brief span in the mid-20th century, synthetic organochlorine insecticides such as chlordane, toxaphene, dieldrin and aldrin came into use. These insecticides would accumulate in the birds or other animals which consumed poisoned Mormon crickets, eventually leading to a toxic dosage level in the insectivores or their predators. USDA discontinued their recommendation for using organochlorine insecticides on Mormon crickets in 1965 (McEwen et. al. 1972). The organochlorine insecticides were replaced with the organophosphate and carbamate insecticides. Certain of these are highly toxic to birds. Blus et. al. (1989) determined that sage grouse die-offs in Southeastern Idaho could be attributed to methamidophos and dimethoate treatments to agricultural fields used by the sage grouse. Martin et. al. (2000) determined that furadan treatments depressed cholinesterase levels in birds in study areas. APHIS protocols do not include insecticides (such as methamidophos, dimethoate, or furadan) that are highly toxic to birds or other terrestrial wildlife in the proposed suppression area.

Field studies have shown that carbaryl applied as either ultra-low-volume (ULV) spray or bait at conventional rates posed little risk to killdeer (McEwen *et al.* 1996a), vesper sparrows (McEwen *et al.* 1996a; Adams *et al.* 1994), or golden eagles (McEwen *et al.* 1996b) in the treatment areas. AChE inhibition at 40 to 60 percent can affect coordination, behavior, and foraging ability in vertebrates. Multi-year studies conducted at several grasshopper treatment areas have shown AChE inhibition at levels of no more that 40 percent with most at less than 20 percent (McEwen *et al.* 1996a). The risk of acute or chronic toxicity to birds or mammals would be negligible under this option.

Stakeholders have strongly expressed concern regarding the reduction of insects as a food source for rangeland insectivores, especially sage grouse and sharp-tailed grouse chicks. In this alternative, the application rates chosen for the

insecticide is reduced from the maximum rate allowed by EPA. Because APHIS would only treat significant outbreak populations, numbers of Mormon crickets surviving the treatment can provide ample nourishment for the insectivores. Additionally, Martin et. al. (2000) and Howe, et. al. (2000) found that Canadian grassland and Idaho shrub steppe bird species were able to make adaptive changes when insecticidal spray reduced the numbers and changed the composition of insect prey species. Prey available to insectivores would be less than under this alternative than under the No Action Alternative.

Plants

Versus the No Action Alternative, Mormon cricket feeding damage would be reduced on rangeland plants, including desirable and undesirable plants, and to crops near rangeland.

Reduction of the Mormon cricket feeding damage may be viewed as having both negative and positive impacts. Mormon crickets feed on invasive weeds such as rush skeletonweed. Limiting the damage Mormon crickets do to invasive weeds would be perceived by most observers as a negative impact. Limiting the damage Mormon crickets do to desirable plants would be perceived by most observers as a positive impact.

Decreasing the amount of foliage consumed by Mormon crickets can make more forage available to other herbivores which may be more highly valued by stakeholders. Livestock, game animals and non-game animals compete with Mormon crickets for forage and shelter in rangeland. This alternative would make more forage and shelter available for other species versus No Action Alternative.

There are no known studies indicating that insecticides may effect species composition of intact biological soil crusts (US Department of the Interior 2001).

Insects

Insecticides would affect nontarget insects within the Mormon cricket treatment area. Field studies have shown that many affected insect populations can recover rapidly after spray or bait treatments and generally have suffered no long-term effects, including some insects that are particularly sensitive, such as bees (Catangui *et al.* 1996).

Nontarget insect species which would be put at risk by treatments under this alternative include non-native biological control agents and pollinators. The level of risk would be greater than the No Action Alternative. The majority of the non-native biological control agents in the proposed suppression area result from release programs carried out by land management agencies and others. The Nez Perce Biological Control Center in Lapwai provides database service which allows managers to report locations of biocontrol releases and

the status of biocontrol agent populations. APHIS would consult with land managers and the Nez Perce Biological Control Center to determine the location and status of biological control agent populations and would select treatment options (including buffering areas) which minimize negative impacts on the populations.

The most widespread, managed, non-native pollinator in the proposed suppression area is the honeybee. Honeybees are found throughout and near the proposed suppression area. APHIS would provide beekeepers with notification of the suppression program and would conduct surveys to detect beeyards in or near proposed treatment blocks. Risk to honeybees would be greater than the risk under the No Action Alternative.

Managed native pollinators include leafcutter and alkali bees. These species might be found in the proposed treatment area, but they are usually encountered in crop areas adjacent to the rangeland. APHIS would conduct surveys and would consult with private landowners to determine if managed native pollinators are near proposed treatment blocks. Risk to managed native pollinators would be higher than the risk under the No Action Alternative.

Unmanaged native pollinators include a vast array of insects and other animals. Risk to unmanaged native pollinators would be greater than the risk under the No Action Alternative.

Insect biodiversity
There might be a temporary decrease in insect biodiversity within treatment blocks.

Spills
Pesticide spills could expose wildlife to excessive levels of insecticide. APHIS maintains spill kits and insures that program personnel are familiar with procedures to mitigate effects associated with a spill.

Socioeconomic issues
The risk that Mormon cricket outbreaks on rangeland would decrease the availability of forage for cattle and sheep is less than under the No Action Alternative because populations would be reduced on rangeland.

There would be reduced risk of major unchecked movement of Mormon crickets into traditional or organic crops resulting in crop loss and additional expenditures for insecticidal control in the crop fields because the overall Mormon cricket population would be reduced.

Cultural resources and events
The availability of Mormon crickets for fish bait and other human uses would be reduced from outbreak levels to more normal levels. Persons using

rangelands for recreation would respond to Mormon crickets as they do under normal conditions versus under outbreak conditions.

Artificial surfaces
Carbaryl and malathion can damage some painted surfaces. Automotive and sign finishes are susceptible to damage by carbaryl and malathion, and automobile or sign owners could suffer economic loss repairing cosmetic damage. APHIS would not apply treatments to un-abandoned vehicles in treatment blocks. APHIS would consult with land managers to insure that Native American petroglyphs are excluded from direct treatment if they occur within treatment blocks. The probability of damage to artificial surfaces by the treatments under this alternative is negligible.

Probability of damage to artificial surfaces by Mormon crickets would be reduced versus the No Action Alternative.

3. Reduced Area Agent Treatments (RAATs) Alternative

Under Reduced Agent Area Treatments (RAATs) Altrernative, either carbaryl, diflubenzuron, or malathion would be used at a reduced rate and over reduced areas of coverage. APHIS would not apply more than a single treatment to an area per year. The maximum insecticide application rates under the RAATs strategy are reduced 50% for carbaryl and malathion sprays, 25% for diflubenzuron spray, and 60% for carbaryl bait versus the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative rates. Although this strategy involves leaving variable amounts of land not directly treated, the risk assessment conducted for the 2002 EIS assumed 100 percent area coverage because not all possible scenarios could be analyzed. However, when utilized under the Alternative expressed in this EA, no more than 50% of the land surface in any treatment block would receive direct treatment.

Carbaryl
Potential exposures to the general public and workers from RAATs application rates are 0.25X for carbaryl spray, 0.20X for carbaryl bait compared to conventional application rates, and adverse effects decrease commensurately with decreased magnitude of exposure. This estimate is based on 50% surface area coverage within a treatment block and the reduced rate of insecticide. These low exposures to the public pose no risk of direct toxicity, carcinogenicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity. The potential for adverse effects to workers is negligible if proper safety procedures are followed, including wearing the required protective clothing. Routine safety precautions are expected to provide adequate protection of worker health at the lower application rates under RAATs.

Direct toxicity of carbaryl to birds, mammals, and reptiles is unlikely in swaths treated with carbaryl spray under a RAATs approach. Carbaryl bait also has minimal potential for direct effects on birds and mammals. Field studies indicated that bee populations did not decline after carbaryl bait treatments, and American kestrels were unaffected by bait applications made at a RAATs rate (George *et al.*, 1992). Using alternating swaths will furthermore reduce adverse effects because organisms that are in untreated swaths will be mostly unexposed to carbaryl.

Carbaryl applied at a RAATs rate has the potential to affect invertebrates in aquatic ecosystems if the insecticide should inadvertently enter water. However, these affects would be less than effects expected under Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative. Fish are not likely to be affected at any concentrations that could be expected under Reduced Agent Area Treatments (RAATs) Alternative.

While carbaryl applied at a RAATs rate will reduce susceptible insect populations, the decrease will be less than under Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative rates. Carbaryl ULV applications applied in alternate swaths have been shown to affect terrestrial arthropods less than malathion applied in a similar fashion.

Diflubenzuron

Potential exposures and adverse effects to the general public and workers from RAATs application rates are 0.375X for diflubenzuron compared to conventional application rates. This estimate is based on 50% surface area coverage within a treatment block and the reduced rate of insecticide. These low exposures to the public pose no risk of methemoglobinemia, direct toxicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity. Potential worker exposures pose negligible risk of adverse health effects.

Diflubenzuron exposures at Reduced Agent Area Treatments (RAATs) Alternative rates are not hazardous to terrestrial mammals, birds, and other vertebrates. Insects in untreated swaths would have little to no exposure, and adult insects in the treated swaths are not susceptible to diflubenzuron's mode of action. The indirect effects to insectivores would be negligible as significant portions of the insect fauna in the treatment area will not be affected by diflubenzuron.

Many of the aquatic organisms most susceptible to diflubenzuron are marine organisms that would not be exposed to rangeland treatments. Freshwater invertebrate populations would be reduced if exposed to diflubenzuron, but these decreases may be temporary given the rapid regeneration time of many aquatic invertebrates. Buffers around water would prevent significant amounts of diflubenzuron from entering water in or near the treatment blocks.

Malathion
Compared to potential exposures under the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative, potential exposures under this Alternative are predicted at 0.25X for malathion spray. This estimate is based on 50% surface area coverage within a treatment block and the reduced rate of insecticide. These low exposures to the public pose no risk of direct toxicity, carcinogenicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity.

Malathion applied at a RAATs rate will cause mortalities to susceptible insects. Organisms in untreated areas will be mostly unaffected. Field applications of malathion at a RAATs rate and applied in alternate swaths resulted in less reduction in nontarget organisms than would occur in blanket treatments. Should malathion applied at RAATs rates enter water, it is most likely to affect aquatic invertebrates. However, these effects would soon be compensated for by the surviving organisms, given the rapid generation time of most aquatic invertebrates and the rapid degradation of malathion in most water bodies. Buffers around water would prevent significant amounts of malathion from entering water in or near the treatment blocks.

General
The implementation of pesticide label instructions and restrictions and the APHIS treatment guidelines will reduce potential impacts from the program use of insecticides (see Appendix 1 treatment guidelines).

Personnel working on the suppression program would be exposed during handling, loading and application of the insecticides. Implementation of the Treatment Guidelines (Appendix 1.) would minimize public exposure and protect workers from harmful exposure. The potential for adverse effects to workers is negligible if proper safety procedures are followed, including wearing the required protective clothing. Therefore, routine safety precautions are expected to provide adequate worker health protection. Decrease in potential worker exposure under this Alternative should be equivalent to the decrease for the general public.

Individuals with hypersensitivity to the insecticides might be affected. APHIS would offer to compile a list of persons who wish to be listed and would either avoid treating areas near their homes or would contact them prior to treatment. If treatments were scheduled near the domiciles of known hypersensitive individuals, they would be advised to avoid treatment blocks. Decrease in potential for exposure would probably be equivalent to the decrease for the general public.

Some stakeholders have indicated that they are opposed to any treatments on public rangelands because they believe treatments would disrupt ecosystems,

cause human health problems or provide an unacceptable advantage to agricultural interests. The anxiety levels of these stakeholders may be increased by adoption of this alternative versus the No Action Alternative. Their anxiety level may be equivalent with any Alternative which includes insecticide applications.

Chances of a pesticide spill would be decrease approximately 50% versus the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative.

Entomophobic persons may have reduced anxieties vs. the No Acton Alternative. Entomophilic persons may have increased anxieties vs. the No Acton Alternative.

Non-target species

Aquatic

Fish are not likely to be affected at any concentrations that could be expected under this Alternative. Although the risk of contamination of water must be rated higher than under the No Action Alternative, untreated buffer areas around all water would prevent entry of toxic concentrations of carbaryl into the water. Compared to potential exposures under Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative potential exposures under this Alternative are predicted at: 0.25X for carbaryl spray, 0.20X for carbaryl bait, 0.375X for diflubenzuron and 0.25X for malathion spray. These estimates are based on 50% surface area coverage within a treatment block and the reduced rates of insecticide. Insecticide concentrations in runoff waters are addressed in the EIS pg C-6. Under worst case scenarios, runoff from a storm intensity of one inch resulted in negligible concentration of insecticide in the runoff water. Probability charts generated by Western Regional Climate Center show that storm intensities of half that magnitude are extremely rare in the proposed project area.

Amphibians

Stakeholders have expressed concern about toxicity of pesticides to frogs in Owyhee County. Amphibians are relatively resistant to diflubenzuron (Eisler 1992). The acute oral LD_{50} of carbaryl to bullfrogs is greater than 4000 mg/kg (Hudson et al, 1984) indicating that carbaryl is slightly toxic to amphibians. The toxicity of malathion is relatively low to adult amphibians but is highly toxic to aquatic stages (EIS pg B-43). The EIS shows estimated daily doses and reference doses for Woodhouse's toad as follows under the full coverage alternative:

	Estimated dose (mg/kg)	Reference dose 1/5 LD_{50}	LD_{50}	Ref. Species
Diflubenzuron	16.56	752	3762	Red-winged blackbird
Carbaryl	62.95	156	780	Sharp-tailed Grouse
Malathion	74.02	30	150	Chicken

The estimated dose under this alternative would be 12.59 mg/kg for carbaryl bait, 18.50 mg/kg for malathion, and 6.21 mg/kg for diflubenzuron.

Mammals and birds

Insecticides applied at the proposed rates are unlikely to be directly toxic to upland birds, mammals, or reptiles. The proposed insecticides are not subject to significant bioaccumulation in animals.

The risk of acute or chronic toxicity to birds or mammals would be correspondingly less under this option than under Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative due to reduced rates and percentage area covered.

The reduction in rate and coverage leaves alternative insect fauna for foraging insectivores (Paige and Ritter 1999). Because APHIS would only treat significant outbreak populations, numbers of Mormon crickets surviving the treatment can provide ample nourishment for the insectivores. Additionally, Martin et. al. (2000) and Howe, et. al. (2000) found that Canadian grassland and Idaho shrub steppe bird species were able to make adaptive changes when insecticidal spray reduced the numbers and changed the composition of insect prey species. Prey available to insectivores should be somewhat less than under this alternative than under the No Action Alternative and somewhat more than under Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative.

Plants

Versus the No Action Alternative, Mormon cricket feeding damage would be reduced on rangeland plants, including desirable and undesirable plants, and to crops near rangeland.

Versus the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative, Mormon cricket feeding damage would be increased on rangeland plants, including desirable and undesirable plants, and to crops near rangeland.

Reduction of the Mormon cricket feeding damage may be viewed as having both negative and positive impacts. Mormon crickets feed on invasive weeds

such as rush skeletonweed. Limiting the damage Mormon crickets do to invasive weeds would be perceived by most observers as a negative impact. Limiting the damage Mormon crickets do to desirable plants would be perceived by most observers as a positive impact.

Decreasing the amount of foliage consumed by Mormon crickets can make more forage available to other herbivores which may be more highly valued by stakeholders. Livestock and game animals and non-game compete with Mormon crickets for forage and shelter in rangeland. This alternative would make more forage and shelter available for other species versus the No Action Alternative. It would make less forage and shelter available for other species versus the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative.

There are no known studies indicating that insecticides may effect species composition of intact biological soil crusts (US Department of the Interior 2001).

Insects

The level of risk to nontarget insects including honeybees, managed native pollinators, and unmanaged native pollinators would be greater than the No Action Alternative and less than the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative. APHIS would consult with land managers and the Nez Perce Biological Control Center to determine the location and status of biological control agent populations and would select treatment options (including buffering areas) which minimize negative impacts on the populations. To maximize the protection of these organisms, APHIS would select carbaryl bait or diflubenzuron whenever possible to suppress Mormon cricket outbreaks.

Insect biodiversity

There might be a temporary decrease in insect biodiversity within treatment blocks compared to Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative. However, the areas left untreated within treatment blocks preserve biodiversity to a great extent.

Spills

The risk of pesticide spills would be decreased approximately 50% versus the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative.

Socioeconomic issues

The risk of Mormon cricket outbreaks on rangeland decreasing the availability of forage for cattle and sheep is less than under the No Action Alternative and greater than under the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative.

Versus the No Action Alternative there would be reduced risk of major unchecked movement of Mormon crickets into traditional or organic crops. Therefore crop losses and additional expenditures for insecticidal control in the crop fields would be reduced. The risk of unchecked movement is greater under this alternative than under the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative.

Cultural resources and events
The availability of Mormon crickets for fish bait and other human uses would be reduced from outbreak levels to more normal levels. Persons using rangelands for recreation would respond to Mormon crickets as they do under normal conditions versus under outbreak conditions. Availability would be reduced less under this Alternative than under the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative.

Artificial surfaces
APHIS would not apply insecticides to un-abandoned vehicles in treatment blocks. APHIS would consult with land managers to insure that Native American petroglyphs are excluded from direct treatment if they occur within treatment blocks.

The probability of damage to artificial surfaces by the treatments under this alternative is negligible. Probability of damage to artificial surfaces by Mormon crickets would be reduced versus the No Action Alternative. The reduction in risk of damage to artificial surfaces by Mormon crickets is less under this Alternative than under the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative.

4. Modified Reduced Area Agent Treatments (RAATs) Alternative (Preferred Alternative)

Under Modified Reduced Area Agent Treatments (RAATs) Alternative either carbaryl bait, or diflubenzuron would be used at a reduced rate and/or over reduced areas of coverage. APHIS would not apply more than a single treatment to an area per year. The maximum insecticide application rate under the Modified Reduced Area Agent Treatments (RAATs) strategy would be 10 pounds of 5% carbaryl bait or 0.75 ounce of diflubenzuron per acre with no more than 50% of any treatment block receiving direct application. Although this strategy involves leaving variable amounts of land not directly treated, the risk assessment conducted for the 2002 EIS assumed 100 percent area coverage because not all possible scenarios could be analyzed.

Carbaryl
Potential exposures and adverse effects resulting from carbaryl bait treatments under this Alternative would be increased up to 2.5X versus Reduced Agent

Area Treatments (RAATs) Alternative and decreased 0.5X versus Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative. No carbaryl spray would be used under this alternative.

Diflubenzuron
Potential exposures and adverse effects resulting from diflubenzuron treatments under this Alternative would be equal to those under Reduced Agent Area Treatments (RAATs) Alternative.

General
The implementation of pesticide label instructions and restrictions and the APHIS treatment guidelines will reduce potential impacts from the program use of insecticides (see Appendix 1 treatment guidelines).

Personnel working on the suppression program would be exposed during handling, loading and application of the insecticides. Implementation of the Treatment Guidelines (Appendix 1) would minimize public exposure and protect workers from harmful exposure. The potential for adverse effects to workers is negligible if proper safety procedures are followed, including wearing the required protective clothing. Therefore, routine safety precautions are expected to provide adequate worker health protection. Decrease in potential worker exposure under this Alternative should be equivalent to the decrease for the general public.

Individuals with hypersensitivity to the insecticides might be affected. APHIS would offer to compile a list of persons who wish to be listed and would either avoid treating areas near their homes or would contact them prior to treatment. If treatments were scheduled near the domiciles of known hypersensitive individuals, they would be advised to avoid treatment blocks. Decrease in potential for exposure would probably be equivalent to the decrease for the general public.

Some stakeholders have indicated that they are opposed to any treatments on public rangelands because they believe treatments would disrupt ecosystems, cause human health problems or provide an unacceptable advantage to agricultural interests. The anxiety levels of these stakeholders may be increased by adoption of this alternative versus the No Action Alternative. Their anxiety level may be equivalent with any Alternative which includes insecticide applications.

Chances of a pesticide spill would be decrease approximately 50% versus the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative and would be equivalent to the RAATs Alternative.

Entomophobic persons may have reduced anxieties vs. the No Acton Alternative. Entomophilic persons may have increased anxieties vs. the No Acton Alternative.

Non-target species

Aquatic

Fish are not likely to be affected at any concentrations that could be expected under this Alternative. Although the risk of contamination of water must be rated higher than under the No Action Alternative, untreated buffer areas around all water would prevent entry of toxic concentrations of carbaryl or diflubenzuron into the water. Compared to potential exposures under Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative potential exposures under this Alternative are predicted at: 0.375X for diflubenzuron and 0.5X for carbaryl bait. These estimates are based on 50% surface area coverage within a treatment block and the rates of insecticide. Insecticide concentrations in runoff waters are addressed in the EIS pg C-6. Under worst case scenarios, runoff from a storm intensity of one inch resulted in negligible concentration of insecticide in the runoff water. Probability charts generated by Western Regional Climate Center show that storm intensities of half that magnitude are extremely rare in the proposed project area.

Amphibians

Stakeholders have expressed concern about toxicity of pesticides to frogs in Owyhee County. Amphibians are relatively resistant to diflubenzuron (Eisler 1992). The acute oral LD_{50} of carbaryl to bullfrogs is greater than 4000 mg/kg (Hudson et al, 1984) indicating that carbaryl is slightly toxic to amphibians. EIS shows estimated daily doses and reference doses for Woodhouse's toad as follows under the full coverage alternative:

	Estimated dose (mg/kg)	Reference dose 1/5 LD_{50}	LD_{50}	Ref. Species
Diflubenzuron	16.56	752	3762	Red-winged blackbird
Carbaryl	62.95	156	780	Sharp-tailed Grouse

The estimated dose under this alternative would be 31.48 mg/kg for carbaryl bait, and 6.21 mg/kg for diflubenzuron.

Mammals and birds

Insecticides applied at the proposed rates are unlikely to be directly toxic to upland birds, mammals, or reptiles. The proposed insecticides are not subject to significant bioaccumulation in animals.

The risk of acute or chronic toxicity to birds or mammals would be less under this option than under Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative and RAATS Alternative.

Prey available to insectivores should be somewhat less than under this alternative than under the No Action Alternative and more than under Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative and RAATs Alternatives.

Plants

Versus the No Action Alternative, Mormon cricket feeding damage would be reduced on rangeland plants, including desirable and undesirable plants, and to crops near rangeland.

Versus the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative and RAATs Alternative, Mormon cricket feeding damage would be increased on rangeland plants, including desirable and undesirable plants, and to crops near rangeland.

This alternative would make more forage and shelter available for other species versus the No Action Alternative. It would make less forage and shelter available for other species versus the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative and the RAATs Alternative.

There are no known studies indicating that insecticides may effect species composition of intact biological soil crusts (US Department of the Interior 2001).

Insects

The level of risk to nontarget insects including honeybees, managed native pollinators, and unmanaged native pollinators would be slightly greater than the No Action Alternative. It would be less than under RAATs Alternative and Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative because of the specificity of the insecticides. APHIS would consult with land managers and the Nez Perce Biological Control Center to determine the location and status of biological control agent populations and would select treatment options (including buffering areas) which minimize negative impacts on the populations.

Insect biodiversity

There might be a temporary decrease in insect biodiversity within treatment blocks compared to No Action Alternative. Compared to Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative and RAATs Alternative, this alternative would be less likely to decrease diversity because of the specificity of the insecticides.

Spills
The risk of pesticide spills would be decreased approximately 50% versus the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative and equal to the RAATs Alternative.

Socioeconomic issues
The risk of Mormon cricket outbreaks on rangeland decreasing the availability of forage for cattle and sheep is less than under the No Action Alternative and the RAATS Alternative and greater than under the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative.

Versus the No Action Alternative there would be reduced risk of major unchecked movement of Mormon crickets into traditional or organic crops. Therefore crop losses and additional expenditures for insecticidal control in the crop fields would be reduced. The risk of unchecked movement is greater under this alternative than under the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative and less than under the RAATs Alternative.

Cultural resources and events
Availability of Mormon crickets for fish bait and other purposes would be greater under this Alternative than under the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative but would be less than under the RAATs Alternative.

Artificial surfaces
The probability of damage to artificial surfaces by the treatments under this alternative is nil. Probability of damage to artificial surfaces by Mormon crickets would be reduced versus the No Action Alternative. The reduction in risk of damage to artificial surfaces by Mormon crickets is less under this Alternative than under the Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative and greater than under the RAATs Alternative.

B. Other Environmental Considerations

1. Cumulative Impacts; Synergistic Effects; and Inert Ingredients and Metabolites

Cumulative impact, as defined in the CEQ NEPA implementing regulations (40 CFR § 1508.7) "is the impact on the environment which results from the incremental impact of the action when added to the past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can

result from individually minor but collectively significant actions taking place over a period of time."

Some exposures, especially to workers, may occur over several days to several months. In addition, and in extremely rare situations, some program activities may be repeated more than once during a year. Such exposures are referred to as cumulative exposures.

Depending on the specific exposure scenario and the nature of the available data, the consequences of cumulative exposures are assessed in a variety of ways in the 2002 EIS.

Some individuals may be exposed to more than one treatment type, either in their job as applicators or because they frequent areas where different types of treatment are applied. Such exposures are considered connected actions, that is, one or more actions that an individual may take that could affect the individual's risk to the insecticides used to suppress Mormon crickets. In addition, all individuals are exposed to a multitude of chemicals and biological organisms every day in foods, medicines, household products, and other environmental chemicals.

Mosquito abatement programs might apply pesticides in or near areas under consideration for Mormon cricket suppression programs. If they did, apply insecticides over rangeland, there would be no need for Mormon cricket suppression treatments because the insecticides used for mosquitoes would exert control on the Mormon crickets. If mosquito abatement treatments were applied to water within or near areas under consideration for Mormon cricket suppression programs, there would be no cumulative effect because the Mormon cricket program would not apply insecticides to water.

Grasshopper suppression treatments might occur on rangelands in the Affected Environment under consideration of this EA. In that case, treatments would be conducted by APHIS. APHIS would insure that all applications were within the limits for annual pesticide application of a single insecticide under FIFRA and that no treatments were made with synergistic insecticides.

Grasshopper and/or Mormon cricket suppression programs might be made on rangeland adjacent to the Affected Environment. In that case they would be made by ISDA or by private individuals. APHIS and ISDA maintain close liaison regarding their respective Mormon cricket survey and suppression programs, so AHIS would be aware when ISDA had conducted or planned to conduct a suppression program. In that case, APHIS would plan any adjacent suppression programs on federally managed lands in a way that would be complimentary to the ISDA program. APHIS employees are in contact with private landowners and are generally aware when landowners have made or plan to make treatments in areas adjacent to federally managed rangelands

where APHIS might conduct suppression programs. In that case, APHIS would plan any adjacent suppression programs on federally managed lands in a way that would be complimentary to the private program.

In some cases, unknown parties have applied treatments for Mormon crickets on public and private rangeland. These treatments are easy to detect after they have been made, because of the presence of dead crickets. However, absent visible Mormon cricket bait or the distinctive odor of an insecticide such as malathion, acephate, or furadan; APHIS cannot determine what insecticide may have been used. In those cases, APHIS would refrain from conducting suppression programs in the immediate vicinity. Applications on federally managed rangelands by unknown parties can be minimized by proactive participation in suppression programs by APHIS which remove the concerns of the parties who would otherwise conduct clandestine treatments. APHIS can be most proactive if logistically expedient treatment methods are available. Spray treatments are more logistically expedient than bait treatments.

Federal land managers may utilize various herbicides to control weeds within the proposed suppression area. APHIS would consult with land managers to determine if herbicides or insecticides have been utilized within the past year on any proposed spray block within the proposed suppression area. APHIS would not apply any insecticide in a manner that conflicts with EPA requirements regarding multiple treatments. APHIS would not apply insecticide to an area known to have been treated within one year with a pesticide known to have cumulative or synergistic effects with the insecticide selected for application by APHIS.

Carbaryl
The only studies of chemical interactions with carbaryl indicate that toxicity of organophosphates combined with carbaryl is additive not synergistic (2002 EIS p B-13).

Although the formulations of carbaryl in some previous spray programs had oil-based carriers (i.e., Sevin 4-oil), current programs have converted to water-based carriers (i.e., SEVIN XLR PLUS). Some information about inert ingredients in these formulations is available. One inert ingredient is propylene glycol or propanediol (antifreeze agent). It degrades readily to carbon dioxide and water in soil and water environments after applications, so actual exposures from the Mormon cricket suppression program would only be acute. The low exposures to humans would not expect to have human health effects except to those few individuals experiencing allergic contact dermatitis. When APHIS would use bait rather than spray formulations, there should be no contact with the skin of any humans except program personnel. Propylene glycol is practically nontoxic to fish and daphnia. Concentrations

of propylene glycol from program application rates would not be anticipated to result in adverse effects to wildlife.

Carbaryl 5% bait is formulated by different manufacturers with a number of different substrates for the bait. Substrates include whole rolled wheat, wheat bran, and grape and apple pumice. For use in Idaho, APHIS normally prefers the formulation based on grape and apple pumice. N-amyl acetate or "banana oil" may be used as a flavor additive in carbaryl bait. N-amyl acetate readily volatilizes to the atmosphere. Biodegradation occurs readily in soil, but there is moderate potential for bioconcentration in aquatic organisms. Although this compound is an irritant of skin, eyes, and mucus membranes, the low potential exposures from program applications of carbaryl bait are not expected to result in any adverse effects to humans. Although it may bioconcentrate in aquatic organisms, the toxicity to those species is low relative to the active ingredient (carbaryl) in the formulation.The major hydrolytic metabolites of carbaryl are glucaronides and sulfates. Most metabolites such as naphthol are considerably less toxic than carbaryl. There has been some concern expressed about the reaction of carbaryl with nitrite under certain circumstances. This may result in the formation of N-nitrosocarbaryl which has been shown to be mutagenic and carcinogenic in laboratory tests (2002 EIS pp B12-B13).

Diflubenzuron

Diflubenzuron is only reported to be synergistic with the defoliant DEF. However diflubenzuron has potential for synergistic effects with nonpesticidal compounds such as cigarette smoke and carbon monoxide which bind with hemoglobin (2002 EIS p B-16).

The primary metabolites of diflubenzuron are 4-chlorophenylurea (CPU) and 2,6-difluorobenzoic acid. The acid metabolite is further metabolized by microorganisms in one to two weeks in soil. The CPU degrades in soil in about 5 weeks. The rapid metabolism and degradation of this metabolite's low concentrations make it highly unlikely that there would be sufficient exposure to cause any of the adverse toxicological effects noted in these studies. Various carriers and adjuvants are used with diflubenzuron to enhance the pesticide applications. These are primarily synthetic and naturals oils. These inert ingredients may include light and heavy paraffinic oils, polyethylene glycol nonylphenyl ether, alkylaryl polyether-ethanols, vegetable oil surfactants, and canola oil. Food-grade canola oil would not be expected to pose any noteworthy hazards, but some of the heavier oils could affect birds and other wildlife. (Use of formulations that use the paraffinic oils may not be appropriate in some habitats with nesting birds, particularly if endangered or threatened species are present or protection of game birds is an issue.) Although the paraffinic oils have been shown to decrease egg-hatch of nesting birds, these effects have only been observed from spills or exposures

higher than are anticipated from program applications. Polyethylene glycol nonylphenyl ether has generally not been of human health concern except for a few cases of allergic contact dermatitis. This should not be an issue if proper program safety precautions are followed. This compound does not persist in natural environments and is unlikely to show bioconcentration of residues (2002 EIS pp B15-B16).

Malathion
Malathion is synergistic with diazinon and may be potentiated by other organophosphate and carbamate insecticides. Studies with dichlorvos and naled showed that toxicity was additive, not synergistic (2002 EIS p B-20).

The main impurities of concern in malathion formulations are isomalathion (95 times as toxic as malathion) and malaoxon (68 times as toxic as malathion). Isomalathion formation results from improper storage or handling of malathion formulations. Malaoxon is formed from malathion's oxidation, which has been reported to occur in air and from volatilization from droplets on various surfaces. Following aerial malathion applications, malaoxon and other transformation products were detectable in air and on various test surfaces for hours and, in some cases, days after the treatment. Levels of malaoxon increased, presumably via oxidation of malathion on some test surfaces for the 9 days of the study. There is some petroleum-based oil that occurs in some ULV formulations. The exposure of birds' eggs and humans to this oil has been shown to have no adverse effects at program application rates (2002 EIS pp B20-B21).

2. Executive Order No. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

   Although specific data are not available, observations indicate that Hispanics and Asians are the minority groups which would be most impacted by the suppression programs because of their involvement in agricultural production systems.

   No Action Alternative may cause Hispanic and Asian farm workers to be exposed to additional insecticides applied to cropland. No Action Alternative may increase costs of operation for Asian and Hispanic farm operators. The other Alternatives would have no disproportionate impact on minority or low income populations.

   Differential human health effects of Carbaryl on individuals with poor nutritional status are analyzed in the 2002 EIS pg B-25.

3. Executive Order No. 13045, Protection of Children from Environmental Health Risks and Safety Risks

The human health risk assessment for the 2002 EIS analyzed the effects of exposure of children to program insecticides (pp B24-B29). Based on review of the insecticides and their use in the Mormon cricket program, the risk assessment concluded that the likelihood of children being exposed to insecticides is very slight and that no disproportionate adverse effects to children are anticipated over the negligible effects to the general population. Treatments are conducted on open rangelands where children would not be expected to be present. No urban areas or schools would be subject to treatment under the proposed action.

Potential for impacts of pesticides on children would be minimized by the implementation of the treatment guidelines, standard operational procedures and added measures included in IV.C.4.

4. Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

   In accordance with various environmental statutes, APHIS routinely conducts programs in a manner that minimizes impact to the environment, including any impact to migratory birds. In January 2001, President Clinton signed E.O. 13186 to ensure that all government programs protect migratory birds to the extent practicable. To further its purposes, the E.O. requires each agency with a potential to impact migratory birds to enter into a Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service (FWS). In compliance with the E.O., APHIS is currently working with FWS to develop such an MOU.

5. Endangered Species Act

   Policies and procedures for protecting endangered and threatened species of wildlife and plants were established by the Endangered Species Act (ESA) of 1973, as amended (16 United States Code (U.S.C.) 1531 et seq.). The ESA is designed to ensure the protection of endangered and threatened species and the habitats upon which they depend for survival. Regulations implementing the provisions of the ESA have been issued. In accordance with section 7 of the ESA, consultation is to be conducted for any action authorized, funded, or carried out by a Federal agency that may affect listed endangered or threatened species or their habitats. APHIS includes proposed species in their consultations. Consultations are conducted with Fish and Wildlife Service (FWS) for terrestrial species and most aquatic species and with the NOAA Fisheries for marine and anadromous species.

   The most recent national biological opinion on the Mormon cricket program was issued by FWS July 21, 1995. In following years, no national biological assessment was prepared since control programs were not anticipated in most

states due to lack of funding. A national biological assessment for the Rangeland Mormon cricket and Mormon Cricket Suppression Program is currently under way, but the process for its completion and consideration by FWS will not be concluded in time for the 2005 season. In order to comply with the Section 7 requirements, APHIS conducts ongoing informal consultations with FWS, locally. The 1995 biological opinion and 1998 biological assessment will be used as a basis for these local consultations and are incorporated into this EA by reference. They are available for public inspection at 9134 West Blackeagle Drive, Boise, Idaho. For this EA, APHIS conducted informal consultation with FWS, Snake River Basin Office and arrived at determinations of protective measures which were needed in addition to those derived from earlier Biological Opinions. APHIS conferred with NOAA Fisheries Boise Idaho office and determined that consultation was not required if the proposed suppression area excluded watersheds of the Salmon river and the Snake River below Brownlee Dam.

Listed Endangered or Threatened Species

The proposed project area may contain suitable habitat for Federally listed Threatened, Endangered or Candidate species. Protection measures and findings of no jeopardy or no effect without buffers or other measures previously approved by FWS are referenced by the date of the biological opinion (FWS dd/mm/yy). Measures developed locally by APHIS and FWS are referenced (FWS yyyy).

Bald Eagle, *Haliaeetus leucocephalus*

The bald eagle is listed as a threatened species in all contiguous 48 States. Bald eagle habitat in southern Idaho is located along the South Fork, the Henry's Fork and the main Snake River downstream to the western border of the project area at King Hill Creek. The South Fork, Henry's Fork and main Snake River is considered year long habitat with the majority of the eagles present during the winter months. There are active bald eagle nests on all of the forks of the Snake River. Some immature birds have been seen at American Falls Reservoir during early spring nest occupancy survey flights. The remainder of the main Snake, Boise, Weiser, Bruneau, and Payette River areas only contain bald eagles during the winter period. Other nest locations in southern Idaho are on the Carbarton stretch of the Payette River, on the Bear River, on the Blackfoot River, and in Lost Valley.

APHIS would maintain 1.0-mile radius treatment-free zone around active nests to avoid disturbing any Bald Eagles. To protect prey species a 500 foot ground buffer and a .25 mile aerial buffer would be maintained along rivers or lakes used for foraging for 2.5 miles up and downstream from active nests. Lakes considered foraging areas would have a 0.25 mile no-aerial treatment buffer.

Bull Trout, *Salvelinus confluentus*
Bull trout have been listed as threatened under the ESA. Within the area in Idaho included in the proposal, bull trout are distributed throughout the Payette, Weiser, and Boise River systems. Bull trout naturally exhibit a patchy distribution, and will not likely occupy all areas of these basins at once. Proposed bull trout critical habitat may also be distributed throughout these basins, and includes some habitat that is not currently known to be occupied. A very general description of bull trout distribution would include the North, Middle and South Fork Payette Rivers; Squaw Creek; the Weiser River Watershed; the Main Boise and South Fork Boise River including Anderson Ranch, Arrowrock and Lucky Peak Reservoirs.

In all areas occupied by bull trout APHIS would utilize a 500 foot buffer for carbaryl bait. For applications of diflubenzuron a 0.5 mile buffer would be maintained. If there are treatment needs within the buffer area, APHIS would consult with FWS on a case by case basis to examine alternatives (FWS 2003).

Banbury Springs Limpet (lanx), *Lanx sp.*; Bliss Rapids Snail, *Taylorconcha serpenticola*; Utah Valvata Snail, *Valvata utahensis*; Idaho Springsnail, *Fontelicella idahoensis*; and Snake River Physa Snail, *Physa natricina*
These five listed mollusks either occupy aquatic habitat found in select springs or they occur on substrate in the main stem of the Snake River.

The Banbury Springs limpet is known to occur at three sites in the Thousand Springs area near Hagerman, Idaho. It has only been found on cobble or boulder substrates in cool, clear, well-oxygenated water. All known populations have occurred in swift currents.

The Bliss Rapids snail has primarily been found on cobble-boulder substrate in flowing reaches of the main stem Snake River and alcove springs. River populations have been found in spring-influenced habitat or near the edge of rapids. Most populations occur in the Hagerman Reach, the tailwaters of Bliss and Lower Salmon Falls dams, large alcove springs, and springs on the Fort Hall Indian Reservation upstream of American Falls Reservoir.

The Utah valvata snail occurs in deep pools with a mud or sand substrate adjacent to rapids or in large perennial spring complexes. This snail has been found in a few springs and main stem Snake River sites in the Hagerman Valley, below American Falls downstream to Burley, Idaho and in the Lake Walcott and Minidoka Dam area.

The Idaho springsnail and the Snake River Physa snail are both main stem Snake River species which occur along stretches of the Snake River near the proposed treatment area.

In areas along the Snake River, APHIS would utilize 500 foot buffer for carbaryl bait. For aerial applications of diflubenzuron a 0.5 mile buffer would be maintained. If there are treatment needs within the buffer area, APHIS would consult with FWS on a case by case basis to examine alternatives. (FWS 2003)

Gray Wolf, *Canis lupus*
The gray wolf has been determined to be an endangered species. Since the translocation of wolves from Canada, the population in Idaho south of Interstate Highway 90 is considered "experimental, non-essential" under Section 10(j) of the Endangered Species Act. Wolves range along the continental divide and into the Island Park area around Yellowstone National Park (YNP). Sightings of gray wolves have been made in diverse parts of the proposed suppression area.

High impact is unlikely as a result of proposed pesticides at proposed rates of application. (FWS 06/01/87)

Canada Lynx, *Lynx canadensis*
On March 24, 2000, the U. S. Fish and Wildlife Service listed the Canada lynx as a Threatened species under the ESA of 1973, as amended. This took effect on April 24, 2000. The proposed treatment areas may contain habitat conditions suitable for Canada lynx foraging, movement and dispersal activities. In Idaho, lynx are thought to primarily occur in the higher elevation, cold forest habitats which support spruce, subalpine fir, whitebark pine and lodgepole pine. Shrub/steppe habitats which occur adjacent to, or are intermixed with, cold forest habitats in Idaho are thought to be used to a limited extent by lynx for foraging and dispersal activities.

APHIS would not treat forested areas or rangelands that are not adjacent to crops but are surrounded by forest and above 5000 feet in elevation in Idaho. (FWS 2003)

Northern Idaho Ground Squirrel, *Spermophilus brunneus brunneus*
The northern Idaho ground squirrel is smaller than most ground squirrels at about 8-9" long. Reddish-brown spots dot its coat, and the squirrel has a short, narrow tail, tan feet and ears, and a grey-brown throat. This rare squirrel needs large quantities of grass seed, stems and other green leafy vegetation to store body energy for its eight-month hibernation from August through March. Adult males (2 years old) emerge from their burrows first in early spring, usually March or early April, followed by the females and then their young. In 1985, scientists estimated that over 5,000 ground squirrels inhabited west-central Idaho. The animals occurred in open meadows and shrub/grasslands among coniferous forests of older Ponderosa pines and Douglas fir. The northern Idaho ground squirrel's population has been greatly reduced, and

today it is found within 20 square miles of public and private lands near Council, Idaho. At high risk of extinction, this animal has suffered a 92% decline in population from 1985 to 1999. Fewer than 500 northern Idaho ground squirrels are estimated to be living at present. The major threat to the northern Idaho ground squirrel is habitat loss due to conifer invasion and fire suppression. Other potential threats include agricultural land conversion, urban development, recreational activities, and naturally occurring events such as severe droughts lasting longer than three years.

If there are treatment needs within the area occupied by North Idaho Ground Squirrel, APHIS would consult with FWS on a case by case basis to examine alternatives. (FWS, 2005)

Proposed Species

Slickspot Peppergrass, *Lepidium papilliferum*

Slickspot peppergrass was included on the federal proposed list in 2002 but the proposal was withdrawn in January 2004. On August 19, 2005, the withdrawal was reversed by court order, and the species is currently proposed for Threatened status. This annual or biennial forb occurs in sagebrush-steppe habitats in southwest Idaho, where it typically grows on micro sites known as slick spots. It is presently known from approximately 45 to 60 sites in Idaho. Many of these sites are adjacent to agricultural lands that have previously been sprayed, especially in the Kuna area.

Robertson (2002) suggested that halictid bees, chrysomelid beetles, dermestid beetles, gelechiid moths and, perhaps, bombyliid flies are capable of pollinating *L. papilliferum*. Robertson and Klemash (2003) reported that 25 insect families from five orders visited flowers, and that seed set is reduced when insects are excluded from flowers. Robertson (2003) suggested that the apparent reliance of slickspot peppergrass on insect-mediated pollination has significant consequences for the long term viability of the species because of the isolated occurrences of populations. Gravity, wind, and water are all believed to play at least some role in seed dispersal. It is possible that ants do as well, since slickspots are occasionally associated with anthills. Robertson and Klemash(2003) reported herbivory by insects on *L. papilliferum* and suggested it might have an effect on survival and fruit production. He also determined that halictid bees are one of the main pollinators of *L.papilliferum*. He also found that sphecid and vespid wasps and tachinid and bombyliid flies can be efficient pollinators.

Mormon crickets feed on Lepidium species (Pfadt 1994) and could eliminate plants and seeds.

APHIS would abide by provisions of the Candidate Conservation Agreement for Slickspot Peppergrass recently developed by several cooperators in Idaho.

APHIS would conduct no aerial spraying within 3 miles of known sites unless land managers made a special request in order to protect the plant from Mormon crickets.

Candidate Species

Columbia Spotted Frog, *Rana luteiventris*
The spotted frog is olive green to brown in color, with irregular black spots. They may have white, yellow, or salmon coloration on the underside of the belly and legs. Tadpoles are black when small, changing to a dark then light brown as they increase in size. Spotted frogs are about one inch in body length at metamorphosis, can attain a length of four inches as adults, and can live more than ten years. They begin reproducing in their second or third year. Softball-sized egg masses are deposited in shallow, calm water in March and April, depending on weather and climate. Tadpoles hatch two to three weeks later, eventually moving from breeding sites to any connected wet areas and feeding on algae, plant material and detritus. Tadpoles transform into small juvenile frogs between late July and November, at which time they forage on tiny insects before seeking shelter for winter hibernation.

Spotted frogs live in spring seeps, meadows, marshes, ponds and streams, usually where there is abundant vegetation. They often migrate along riparian corridors between habitats used for spring breeding, summer foraging, and winter hibernation. Depending on climate and habitat conditions, spotted frogs may begin seeking overwinter sites as early as September. Springs, cutbanks, and willow roots provide quality habitat for hibernacula that are well-oxygenated and stable in temperature.

Prior to 1997, the Columbia spotted frog and the Oregon spotted frog were lumped into one species, *Rana pretiosa.* Additional genetic information indicated that they are two separate species. Columbia spotted frogs have been further divided into four populations, including the Great Basin population. The Great Basin population is found in Eastern Oregon, Southwestern Idaho, and Nevada. In Idaho, it occurs in the mid-elevations of the Owyhee uplands and in Southern Twin Falls County.

Threats to the Great Basin population of Columbia spotted frogs include grazing, spring development, road and trail construction, water diversion, fire in riparian corridors, pesticides, disease, and the introduction of non-native fish. Increasing habitat fragmentation due to activities that reduce riparian connectivity makes local populations vulnerable to extirpation.

APHIS would utilize buffers around all water bodies to provide protection for this candidate species. (FWS 2003)

Southern Idaho Ground Squirrel, *Spermophilus brunneus endemicus*
The Southern Idaho ground squirrel is about 8-9" long, with a short, narrow tail, tan feet and ears, and a grey-brown throat. This small-eared mammal differs from a similar subspecies the Northern Idaho ground squirrel in pelage coloration. The southerns have a noticeably paler coat than the northerns, which is attributed to the lower-elevation, sagebrush/grassland habitat in which it lives. The granitic sands and clays of the Weiser River Basin are thought to influence the Southern Idaho ground squirrel's lighter coloration, while the deeper reddish-colored northerns are found in higher-elevation areas with shallow reddish soils of basaltic origin. Research suggests that the squirrels prefer areas with a high percentage of native cover such as big sagebrush, bitterbrush and a variety of native forbs and grasses; however, some nonnative features may enhance their survival such as alfalfa fields, haystacks or fence lines.

These squirrels spend much of their time underground. Adults emerge from seasonal hibernation in late January or early February, depending on elevation and habitat conditions. As with other ground squirrels in the Northwest, the adults have a short active season above ground of 4 to 5 months. During this time, the animals feed on large quantities of grass seed, stems and green leafy vegetation which are required for storage of fat to survive long months of hibernation. When squirrels emerge from their burrows they begin breeding, young are born about three weeks later and emerge from the nest burrow in about 50 days. The ground squirrels cease their above ground activity by late June or early July to return to their burrows for hibernation.

During the past 30 years, a dramatic population decline of Southern Idaho ground squirrels has occurred. Surveys indicate a precipitous decline in squirrel populations since the mid-1980s. In 1985, one study estimated the population at around 40,000. A 1999 survey of 145 of the 180 known historical population sites indicated that only 53 sites (37 percent) were still occupied. Furthermore, 52 of the 53 sites had what biologists characterized as "remarkable low levels of activity". The Southern Idaho ground squirrel occurs within an 810-square mile area (Gem, Payette and Washington counties).

Threats to Southern Idaho ground squirrels include exotic grasses and weeds, habitat fragmentation, direct killing from shooting, trapping or poisoning, predation, competition with Columbian ground squirrels (*Spermophilus columbianus*), and inadequacy of existing regulatory mechanisms to protect the species or its habitat. Most of these threats occur throughout the range of the species.

APHIS would consult with FWS to address site-specific concerns if treatments were needed in occupied areas. (FWS 2003)

Yellow-billed cuckoo, *Coccyzus americanus*
The yellow-billed cuckoo is a secretive, robin-sized songbird that lives in the Western United States in willow and cottonwood forests along rivers and streams. The birds are generally absent from heavily forested areas and large urban areas. Yellow-billed cuckoos primarily eat large insects such as caterpillars and cicadas, as well as an occasional small frog or lizard. Cuckoos usually lay two or three eggs, and the young develop very rapidly. On average, it takes 17 days from egg-laying to fledging of young. Yellow-billed cuckoos breed from southern Canada south to the Greater Antilles and Mexico. While the yellow-billed cuckoo is common east of the Continental Divide, biologists estimate that more than 90 percent of the bird's riparian habitat in the West has been lost or degraded as a result of conversion to agriculture, dams and riverflow management, bank protection, overgrazing, pesticide use, and competition from exotic plants such as tamarisk.

Populations have declined rapidly throughout the western U.S. in the twentieth century, and are extirpated from British Columbia, Washington, and possibly Nevada. In Idaho, the species is considered a rare visitor and breeder in the Snake River Valley, occurring in ten of the counties within the proposed suppression area.

Because the birds are primarily found in riparian areas, potential threats include conversion of this habitat to agriculture, dams and riverflow management, bank protection, livestock overgrazing, agricultural water use, pesticide use, and competition from exotic plants.

APHIS would utilize buffers around all water bodies to provide protection for this candidate species. (FWS 2003)

Christ's paintbrush, *Castilleja christii*
Christ's paintbrush is about five to 15 inches tall, and it has brilliant yellow-orange flowers. This plant grows best in moist, gently-sloping subalpine meadows, and it reproduces by seed. Plant growth begins around snowmelt time, leading to peak flowering from July to mid-September.

John Christ first collected this plant in 1950 from the Albion mountain range in Cassia County, Idaho. Noel Holmgren and Jim Reveal collected it again in 1966. After Holmgren formally described the plant in 1973, Christ's paintbrush was recognized as a new species named in honor of its first collector, John Christ.

This plant is found only on lands managed by the Sawtooth National Forest in the high elevations of the Albion Mountains in Cassia County, Idaho. Only one population of the plant is known to exist.

Road construction and maintenance, off-road vehicle use, livestock grazing, recreational activities such as hang gliding and hiking, and trampling all have adverse effects on *Castilleja christii.*

The FS is working with the local hang gliding club to reduce impacts from trampling and vehicles on Christ's paintbrush, since the area is a very popular launch site for hang gliders. Signs that inform the public of the fragile nature of subalpine communities are also being developed by the Forest Service. Vehicle travel is restricted to existing roads, some of which have been improved to allow for easier travel, as well as to minimize impacts from off-road vehicle use.

APHIS would not apply any insecticide treatments within one mile of the known population.

Species under Review by U.S. Fish and Wildlife Service or Petitioned For Listing as T&E

Columbian Sharp-tailed Grouse and Sage Grouse

Both of these grouse species are BLM listed sensitive species. The Columbian sharp-tailed grouse has been petitioned for listing under the ESA. On February 7, 2003, FWS found that the Western subspecies of sage grouse is not eligible for federal protection under ESA. On December 3, 2004 based on an extensive review of scientific data and analysis, senior regional U.S. Fish and Wildlife Service biologists were reported to have recommended that the Service not list the greater sage-grouse as a threatened or endangered species under the Endangered Species Act across its range.

Young grouse hatch in the spring at about the same time as Mormon cricket populations begin to mature. Insects are a critical source of protein for the young birds. Large Mormon cricket populations may be common in the critical habitat of both species.

Bonneville Cutthroat Trout and Yellowstone Cutthroat Trout
Both the Bonneville cutthroat trout and Yellowstone cutthroat trout are currently petitioned for listing as threatened under the ESA. The Bonneville cutthroat trout is limited to the Bear River watershed. The Yellowstone cutthroat trout is believed to occupy a number of streams scattered across Eastern Idaho. Their current distribution is under investigation.

Mulford's Milkvetch, Woven-Spore Lichen, and Malheur Princesplume

These plants are currently under review by the FWS for listing as federal candidate species.

Mulford's milkvetch is endemic to Southwest Idaho and extreme Southeast Oregon, where it grows in deep sandy soils. It is typically associated with bitterbrush, needle-and-thread grass, and Indian ricegrass. In Idaho, Mulford's milkvetch is known from Ada, Owyhee, Payette, and Washington counties. While no information is available regarding its pollination biology, Mulford's milkvetch is believed to be insect pollinated. Seed dispersal is most likely by gravity and wind. Although no data are readily available, it may be consumed by Mormon crickets.

Woven-spore lichen grows on humus in sagebrush-steppe habitats in Southwest Idaho, Central Oregon, and Southern Washington. Several localities are also known from Southern California. Woven-spore lichen has been found at 14 localities in Idaho, all within Ada and Elmore counties. Most of the sites are adjacent to or are surrounded by private land. Nothing is known of its reproductive or dispersal mechanisms. Although no data are readily available, it may be consumed by Mormon crickets.

The FWS initiated a status review for Malheur prince's-plume in 2000. This showy, three foot tall biennial plant species is known from six widely scattered localities in Gooding, Owyhee and Washington counties in southwest Idaho. It grows only on sparsely vegetated clay soils. Approximately 15 populations of Malheur prince's-plume are known from southeast Oregon in Harney and Malheur county. A variety of bees and beetles have been observed visiting the flowers, but no pollination studies have been conducted. Although no data are readily available, it may be consumed by Mormon crickets.

Table 1.1 Protection Measures and Determinations for Special Status Species

Bald Eagle (T) Not likely to adversely affect (NLAA)	1-mile radius treatment-free zone around active aeries found on rivers and lakes with no flyovers of this area by contract pilots. Maintain a 2.5 mile no aerial treatment zone upstream and downstream from the nest site with a 0.25 mile buffer along each side of the river. Lakes considered foraging areas would have 0.25 mile no-aerial treatment buffer. (From FWS 06/01/87)
Bull Trout (T) NLAA	In all areas proposed as critical habitat for bull trout, APHIS would utilize a 500 foot buffer for carbaryl bait and a 0.5 mile buffer for diflubenzuron spray. If there are treatment needs within the buffer area, APHIS would consult with FWS on a case-by-case basis to examine alternatives. (FWS 2003)
Banbury Springs Limpet (lanx) (E), Bliss Rapids Snail (T), Utah Valvata Snail (E), Idaho Springsnail (E), Snake River Physa Snail (E) NLAA	In areas along the Snake River between C.J. Strike Reservoir and American Falls Reservoir APHIS would utilize a 500 foot buffer for carbaryl bait and a 0.5 mile buffer for diflubenzuron spray. If there are treatment needs within the buffer area, APHIS would consult with FWS on a case-by-case basis to examine alternatives. (From FWS 2003)
Gray Wolf (E) (experimental) NLAA	High impact unlikely as a result of proposed pesticides at proposed rates of application. (FWS 06/01/87)
Canada Lynx (T) NE	APHIS would not treat forested areas or rangelands that are not adjacent to crops but are surrounded by forest and are above 5000 feet in elevation in Idaho. (FWS 2003)
Northern Idaho Ground Squirrel (T) NLAA	APHIS would consult with FWS on a case by case basis for any treatments to the land described by FWS as North Idaho Ground Squirrel recovery area. (FWS 2005)

Table 1.2 Protective Measures for Proposed Species

Slickspot Peppergrass (PE)	Insecticide application rates would be reduced below EPA maximum allowable rates. Carbaryl bait would be applied at no more than 25% of the labeled maximum rate and diflubenzuron would be applied at 37.5% of the labeled maximum rate. Additionally, treatment blocks would not receive full area coverage. 50% to >99% of treatment block would not receive direct application under preferred alternative. APHIS would conduct no aerial spraying within 3 miles of known sites unless land managers made a special request in order to protect the plant from Mormon crickets.

Table 1.3 Protective Measures for Candidate Species

Columbia Spotted Frog (C) Southern Idaho Ground Squirrel (C) Yellow-billed cuckoo (C) Christ's Paintbrush	Insecticide application rates would be reduced below EPA maximum allowable rates. Carbaryl bait would be applied at no more than 25% of the labeled maximum rate and diflubenzuron would be applied at 37.5% of the labeled maximum rate. Additionally, treatment blocks would not receive full area coverage. 50% to >99% of treatment block would not receive direct application under preferred alternative. Aerial applications of carbaryl bait or diflubenzuron spray would not be made within 500 feet of water. Ground applications of carbaryl bait would not be made within 50 feet of water. APHIS would consult with USFWS before treating occupied Southern Idaho Ground Squirrel habitat. APHIS would not treat within one mile of known populations of Christ's Paintbrush. To avoid potential harm to the Columbia spotted frog with ground treatments of carbaryl bait, APHIS would use a 50 ft buffer from the edge of the riparian zone or wet meadow in treatment areas in the Owyhee and Bruneau Field Offices on the south side of the crest of the Owyhee Mountain Range. The BLM will provide APHIS field crews with a one day training session to assist in the identification of the riparian and wet meadow areas of concern.

Table 1.4 Protective Measures for Species Under Review or Sensitive Species

Bonneville Cutthroat Trout Yellowstone Cutthroat Trout and Redband Trout (S) Mulford's Milkvetch, Woven-Spore Lichen, Malheur Princesplume, Mourning Milkvetch, Picabo Milkvetch, Snake River Milkvetch, Janish's Penstemon, Matted Cowpie Buckwheat, and St. Anthony Evening Primrose (S) Western Burrowing Owl, Northern Harrier, Upland Game Birds and the Swainson's Hawk (S) Western Toad, Woodhouse's Toad, and Northern Leopard Frog (S) Western Ground Snake, Longnose Snake and Common Garter Snake (S) Townsend's Big Eared Bat, Spotted Bat, Western Small-footed Myotis, Long Eared Myotis, Fringed Myotis, Long-legged Myotis, Western Pipistrelle, and Yuma Myotis (S) Kit Fox (S)	Insecticide application rates would be reduced below EPA maximum allowable rates. Percentage of EPA maximum allowable rates which would be applied: carbaryl bait 25% diflubenzuron spray 37.5% Additionally, treatment blocks would not receive full area coverage. 50% to >99% of treatment block would not receive direct application. Aerial applications of carbaryl bait or diflubenzuron spray would not be made within 500 feet of water. Ground applications of carbaryl bait would not be made within 50 feet of water.

6. Environmental Monitoring

Monitoring involves the evaluation of various aspects of the Mormon cricket suppression programs. There are three aspects of the programs that may be monitored. The first is the efficacy of the treatment. APHIS will determine how effective the application of an insecticide has been in suppressing the

Mormon cricket population within a treatment area and will report the results in a Work Achievement Report to the Western Region.

The second area included in monitoring is safety. This includes ensuring the safety of the program personnel through medical monitoring conducted specifically to determine risks of a hazardous material. (See APHIS Safety and Health Manual (USDA, APHIS, 1998) available online at: www.aphis.usda.gov/mb/aseu/shes/shes-manual.html).

The third area of monitoring is environmental monitoring. APHIS Directive 5640.1 commits APHIS to a policy of monitoring the effects of Federal programs on the environment. Environmental monitoring includes such activities as checking to make sure the insecticides are applied in accordance with the labels, and that sensitive sites and organisms are protected. The environmental monitoring recommended for Mormon cricket and grasshopper suppression programs involves monitoring sensitive sites such as bodies of water used for human consumption or recreation or which have wildlife value. Additionally, monitoring may include endangered or threatened species habitat, other sensitive wildlife species habitat, edible crops, and any sites for which the public has expressed concern or where humans might congregate (e.g., schools, parks, hospitals). APHIS does conduct post-treatment assessments to determine if any non-target impacts may be attributed to the treatments. Observers monitor wildlife including migratory birds to determine if any mortality or unusual behaviors are exhibited.

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VII. Listing of Agencies and Persons Consulted

Artimez, Debbie, National Oceanic and Atmospheric Administration, 10215 W. Emerald, Suite 180, Boise, ID 83704

Burch, Susan, Contaminant Specialist, Snake River Basin Office, U.S. Fish and Wildlife Service, U.S. Dept. of The Interior, 1387 S. Vinnell Way, Suite 368, Boise, ID 83709

Carrigan, Tim, Wildlife Biologist, Four Rivers Field Office, Boise District, Bureau of Land Management, Dept. of Interior, 3948 Development Ave., Boise, ID 83705

Clark, James, Wildlife Biologist, Bruneau Field Office, Boise District, Bureau of Land Management, Dept. of Interior, 3948 Development Ave., Boise, ID 83705

Cook, Leroy, Resource Coordinator, Upper Snake River District, Bureau of Land Management, Dept. of Interior, 1405 Hollipark Dr., Idaho Falls, ID 83401

Cooper, Mike, Acting Administrator, Plant Industries Division, Idaho State Department of Agriculture, 2270 Old Penitentiary Rd., PO Box 790, Boise, ID 83709

Foster, Jon, Supervisor Resource Manager, State Office, Bureau of Land Management, Dept. of Interior, 1387 S. Vinnell Way, Boise, ID 83709

Grinde, Pete, Range Specialist, Payette National Forest, Forest Service, US Dept of Agriculture, 3674 Highway 95, New Meadows, ID 83654

Grows, Walt, Range Specialist, Caribou Office, Forest Service, US Dept. of Agriculture, 1405 Hollipark Dr., Idaho Falls, ID 83401

Haas, Alison Beck, Supervisory Fish and Wildlife Biologist, Snake River Basin Office, 1387 S. Vinnel Way, Boise ID 83709

Hatch, John L. Resource Advisor, Boise District, Bureau of Land Management, Dept. of Interior, 3948 Development Ave., Boise, ID 83705

Paris, Sharon, Planning Coordinator, State Office, Bureau of Land Management, Dept. of Interior, 1387 S. Vinnell Way, Boise, ID 83709

Ririe, Warren, Range Conservationist, Boise National Forest Headquarters, Forest Service, US Dept. of Agriculture, 1249 S. Vinnell Way, Suite 200, Boise, ID 83709

APPENDIX 1. FY-2006
Guidelines for Treatment of Rangeland for the Suppression of Grasshoppers and Mormon Crickets

Suppression Treatment on Federally Managed Rangeland

Subject to available funding, the United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (USDA-APHIS-PPQ) may contribute to the control of grasshoppers and Mormon crickets on federal rangeland in three ways: (1) conduct field surveys, (2) provide technical assistance to land managers, and (3) participate in suppression treatments when requested and necessary. In situations when traditional practices of land managers fail to maintain grasshopper and Mormon cricket populations below outbreak levels, USDA-APHIS-PPQ, at the request of the Federal land management agency or Tribal authority, when appropriate and subject to available funding, may conduct suppression treatments on federally managed rangeland or rangeland held in Trust by the federal government.

Rangeland eligible for cooperative suppression treatments for grasshoppers include: (1) large rangeland blocks (i.e., $\geq$10,000 acres) that if treated would protect forage as well as prevent re-infestation from immigrant grasshoppers; (2) incipient populations ("hot spots") of grasshoppers that if treated would prevent a wider spread of outbreaks; and (3) Federal or Trust land borders that if treated would prevent the movement of damaging populations of grasshoppers to adjacent private agricultural land. Rangeland cooperative suppression treatments for Mormon crickets may be conducted on a small or large scale. The final determination of whether a cooperative suppression treatment on federal rangeland is warranted and feasible (biologically, logistically, and economically) will be made by USDA-APHIS-PPQ, upon receipt of the land manager's written request and based on the best available information.

Suppression Treatments on State and Private Rangeland

Subject to available funding, the USDA-APHIS-PPQ may contribute to the suppression of grasshoppers and Mormon crickets on State and private rangeland in three ways: (1) conduct field surveys, (2) provide technical assistance to landowners, and (3) participate in suppression treatments when requested and necessary. In situations when traditional practices of land managers fail to maintain grasshopper and Mormon cricket populations below outbreak levels, USDA-APHIS-PPQ, at the request of the State Department of Agriculture and/or private landowners, and subject to available funding, may conduct suppression programs on State and private rangeland.

State and private rangeland eligible for cooperative suppression treatments for grasshoppers include: (1) large rangeland blocks (i.e., $\geq$10,000 acres) that if treated would protect forage as well as prevent re-infestation from immigrant grasshoppers; and (2) incipient populations ("hot spots") of grasshoppers that if treated would prevent a wider spread of outbreaks. State and private rangeland cooperative suppression treatments for Mormon crickets may be conducted on a small or large scale. However, USDA-APHIS-

PPQ will not participate in cooperative suppression programs for grasshoppers and Mormon crickets on private cropland, except when deemed necessary to maintain the integrity of a large spray block. Subject to available funding and as mandated by the Plant Protection Act (PPA) of 2000, APHIS will conduct surveys, provide technical assistance and conduct suppression programs on rangeland to control grasshoppers and Mormon crickets as warranted and feasible both biologically and logistically.

General Guidelines for Suppression Programs on Rangeland

1. Cooperative suppression treatments will be completed in accordance with the Plant Protection Act (PPA) of 2000 and Agency policy. Suppression treatments will follow guidelines within the Environmental Impact Statement (EIS), Site-Specific Environmental Assessment (EA), Section 7 Consultation of the Endangered Species Act, 2004 Environmental Monitoring Plan, pesticide label, and the 2006 Guidelines stated herein.

2. The Grasshopper Program will follow all requirements of the National Environmental Protection Act (NEPA). Environmental Assessments (EAs) for suppression treatments on rangeland will be completed in accordance with National and/or local Memoranda of Understanding (MOUs) between USDA-APHIS-PPQ and the Federal land management agencies and/or Tribes. Prior to treatments and per Section 7 Consultation, USDA-APHIS-PPQ and/or the Federal land manager and/or Tribe will consult locally with U.S. Fish & Wildlife Service (USFWS) and/or National Oceanic and Atmospheric Administration (NOAA) Fisheries in situations where: (1) threatened or endangered species occur in the area, or (2) pesticides or application procedures utilized have not been addressed in the Programmatic Biological Opinion of 1995 or in other Opinions. Upon completion of the EA, the State Plant Health Director of USDA-APHIS-PPQ or his/her designee will, if appropriate, sign a Finding of No Significant Impact (FONSI), after which suppression treatments may commence.

3. The Federal Government will bear 100% of the cost of treatment on federally managed or Trust land, up to 50% of the cost on State land, and up to 33% of cost on private land. The Federal Government's participation in the cost share is contingent on allocation and availability of funds and written request of land manager. First, USDA-APHIS-PPQ will conduct or fund surveys from the congressional appropriation, then may conduct suppression treatments with any remaining funds, and if requested. Additional sources of support for suppression treatments may include Contingency funds, Commodity Credit Corporation (CCC) funds, Land Management Agencies' funds, or other funding resources.

4. Land managers are responsible for the overall management of rangeland under their control to prevent or reduce the severity of grasshopper and Mormon cricket outbreaks. It is recommended that the land managers have exhausted all Integrated Pest Management systems before USDA-APHIS-PPQ is asked to assess the suppression treatment of grasshopper and Mormon cricket outbreaks. USDA-APHIS-PPQ and/or

its designated cooperator may conduct suppression treatments on Federal/Tribal lands if requested in writing by the Federal land manager and/or Tribal authority for Trust lands.

5. USDA-APHIS-PPQ, when requested by the land manager, may conduct border treatments on Federal or Trust rangeland in situations when damaging populations of grasshoppers and Mormon crickets threaten private agricultural land. Border treatments can only be justified when the potential for damage from grasshoppers and Mormon crickets migrating into private agricultural lands constitutes a legitimate and justifiable threat.

6. At the written request of the respective State Department of Agriculture, and/or private landowner, USDA-APHIS-PPQ and/or the designated cooperator may conduct cooperative suppression programs on State and/or private rangeland, as permitted by regulations and available funding.

7. In the absence of available USDA-APHIS-PPQ funding, the Federal land management agency, Tribal authority or other party may opt to reimburse USDA-APHIS-PPQ for suppression treatments. Interagency agreements or reimbursement agreements must be completed prior to the start of treatments.

8. For rangeland programs conducted by the Federal government, USDA-APHIS-PPQ and/or cooperating personnel (i.e., cooperative agreement) will provide overall direction and monitoring of aircraft calibration, pesticide inventory and application, and will maintain records of pesticides used and acres treated. In a suppression program that requires a Contracting Officer (CO) a Contracting Officer Representative (COR) will be required, and a letter of authority issued. In other smaller programs it is recommended that a properly trained Grasshopper/Mormon Cricket manager be responsible for the program, and he or she will have received the necessary training as prescribed by PPQ.

9. In some cases, rangeland treatments may be conducted by other Federal agencies (e.g., Forest Service, Bureau of Land Management, or Bureau of Indian Affairs) or by non-Federal entities (e.g., Grazing Association or County Pest District). USDA-APHIS-PPQ may choose to assist these groups in a variety of ways, such as: (1) loaning equipment; (2) providing materials and pesticides; and (3) and contributing in-kind services such as surveys, determination of insect species and instars, and treatment monitoring. A cooperative agreement is needed when the assistance by USDA-APHIS-PPQ represents significant monetary value (e.g., providing pesticide or loaning equipment). Finally, the USDA-APHIS-PPQ State Plant Health Director (SPHD) is responsible for ensuring that any cooperative treatments on State or private rangeland adhere to the cost-share ratios in the Plant Protection Act and NEPA, as applicable.

10. Prior to initiating treatments funded by or through USDA-APHIS-PPQ, the SPHD's office will prepare a Detailed Work Plan (including a map), which then must be approved by the USDA-APHIS-PPQ Western Regional Office. In addition, the USDA-

APHIS-PPQ State office will provide a weekly update to the Western Regional Office on acres treated and pesticides used. Upon completion of each grasshopper or Mormon cricket suppression program, the USDA-APHIS-PPQ State office will prepare a summary for the Federal land manager or Tribal authority and will submit a Post Treatment Report to the Western Regional Office.

11. The State Registered Beekeepers shall be notified in advance of proposed rangeland treatments so that beekeepers may remove their bees before a suppression program begins. Observation aircraft may be used to check for bees in the proposed area. Registered bee locations must be documented on the treatment map. Non-treated buffer zones should be determined for pollinators (e.g., alkali, leafcutter or honey bees) based on the EA and the pesticide labels [See 2006 Operational Procedures below].

12. In accordance with the EIS, the following pesticides may be used for rangeland treatments of grasshoppers and Mormon crickets: Sevin XLR Plus, Carbaryl bait, Dimilin 2L, and Malathion ULV. All pesticides must be used in accordance with the label, NEPA documents, Biological Opinion, local Section 7 Consultation, 2006 Operational Procedures, and any pertinent local decisions that are more restrictive.

13. Treatment contracts will adhere to the 2006 Prospectus.

2006 Operational Procedures

GENERAL PROCEDURES FOR ALL AERIAL AND GROUND APPLICATIONS

1. Follow all applicable Federal, State, Tribal and local laws and regulations in conducting grasshopper and Mormon cricket suppression treatments.

2. Conduct scoping programs to allow public participation in the decision making process.

3. Notify Federal, State and Tribal land managers and private cooperators of grasshopper and Mormon cricket infestations on their lands. Describe estimated boundaries, severity of the infestation, and treatment options. This notification will request the land manager to advise USDA-APHIS-PPQ of any sensitive areas (e.g., parks, recreation areas, etc.) that may exist in the proposed treatment areas.

4. Obtain request(s), in writing, from land managers or landowners for suppression treatments to be undertaken on their land.

5. Notify residents within treatment areas, or their designated representatives, prior to proposed operations. Advise them of control method to be used, proposed method of application, and precautions to be taken.

6. Avoid residences and other premises whose occupants are opposed to their property being treated. In cases when State law requires treatment, but landowners or occupants are opposed to the treatments, USDA-APHIS-PPQ will cooperate to the extent possible and as authorized by Federal and State laws.

7. Instruct program personnel in the use of equipment, materials and procedures; supervise to ensure procedures are properly followed.

8. USDA-APHIS-PPQ employees who plan, supervise, recommend, or have the potential to perform pesticide treatments must be certified and trained under the USDA-APHIS-PPQ Pesticide Applicator Certification Policy. They are also required to fulfill any additional qualifications or pesticide use requirements of the State wherein they perform these duties. State Plant Health Directors have the option for seasonals to take the Pesticide Certification core training without the 2 day fumigation workshop. This only certifies that the seasonal had core Pesticide Certification training. Pesticide Applicator status is available to the seasonals with completed core pesticide training and the 2 day workshop as indicated by their supervisor. CFR 40 171.6 standard defines Supervision of a non certified pesticide applicator as; The availability of the certified applicator must be directly related to the hazard of the situation. In many situations, where the certified applicator is not required to be physically present, "direct supervision" shall include verifiable instruction to the competent person, as follows: (1) Detailed guidance for applying the pesticide properly, and (2) provisions for contacting the certified applicator in the event he is needed. In other situations, and as required by

the label, the actual physical presence of a certified applicator may be required when application is made by a non certified applicator.

9. Strictly follow all EPA and State approved label instructions for insecticides.

10. Do not apply insecticides directly to water bodies (defined herein as reservoirs, lakes, ponds, pools left by seasonal streams, springs, wetlands, and perennial streams and rivers). Furthermore, provide the following buffers for water bodies: 500-foot buffer with aerial liquid insecticides; 200-foot buffer with aerial bait; and 50-foot buffer with ground bait.

11. Require unprotected workers to stay out of treated areas, according to the label re-entry requirements or until the insecticide has dried, whichever period is longer.

12. Protective clothing and equipment will be worn and used by all pilots, loaders, and field personnel, as specified on the label.

13. All insecticide containers must be stored and disposed of properly according to the label. Rinse solution for drums may be used as diluents in preparing spray tank mixes, or it may be collected and stored for subsequent disposal in accordance with label instructions. Use one of the following disposal methods (in order of preference):

    a) Use full service contracts and require the contractor to properly store and dispose of pesticide containers.

    b) Require chemical companies, distributors, or suppliers to accept the triple-rinsed containers.

    c) Crush and/or puncture the empty triple-rinsed containers, report on Form AD-112 to Property Services, Field Servicing Office, Minneapolis, MN, and dispose of as scrap metal.

    d) Other suitable methods as approved locally in concurrence with Safety, Health and Environmental Security (SHES; Bill Benson, 301-734-5577).

14. Conduct mixing, loading, and unloading in areas where an accidental spill would not contaminate a water body. In the event of an accidental spill, follow the procedures set forth in PPQ Guidelines for Managing Pesticide Spills (USDA APHIS, *Treatment Manual*, 1996, pages 11.17-11.26) and the 1996 Aerial Application Manual (4.37-4.39).

15. Local law enforcement agencies and fire officials will be notified of pesticide storage areas and treatment blocks. Be sure MSDS sheets are available to local law enforcement, local medical and to application personnel.

16. All APHIS project personnel will have baseline cholinesterase tests before the first application of AChe inhibiting insecticides, such as organophosphates or carbamates (i.e., no testing required for dimilin usage), and on a routine basis as described in the *APHIS Safety and Health Manual*. It is recommended that contract, State, and private project personnel also participate in a cholinesterase monitoring program.

17. Endangered Species Act Compliance

    a) a. Formal consultations with US Fish and Wildlife Service up through July 21, 1995 guide the program on a national basis through biological assessments and biological opinions. For Federal Threatened, Endangered, and Proposed Species issues which have arisen since 1995, local informal consultation with Fish and Wildlife Service and/or NOAA Fisheries is required.

    b) b. State-listed endangered and threatened species, Federal candidate species, and other sensitive areas may be addressed in the site-specific EA.

18. USDA-APHIS-PPQ will assess rangeland programs for the efficacy of the treatment, to verify that control programs have properly been implemented and treatments fall within our guidelines and control levels.

SPECIFIC PROCEDURES FOR AERIAL APPLICATIONS

1. Aircraft, dispersal equipment and pilots that do not meet all contract requirements of the 2006 Prospectus will not be allowed to operate on the Program.

2. Use Global Positioning System (GPS) coordinates or shape files if available, for pilot guidance on the parameters of the spray block. Ground flagging or markers should accompany GPS coordinates, when necessary, in delineating the project area and in omitting areas from treatment (e.g., boundaries and buffers for bodies of water, habitats of protected species, etc.).

3. Utilize two-way communication equipment for appropriate field personnel. Communication will be available for continuous contact between pilots and the COR.

4. Pre-spray reconnaissance flights or ground orientation trips may be conducted to ensure that pilots are familiar with program area boundaries, buffers, and areas that are not to be treated.

5. Make the following available to all personnel in advance of any treatment: First Aid kits, pesticide spill kits, thermometers, flagging material, wind gauges, spray-deposit samplers, and daily aircraft records. Examples of contents of the first aid and Pesticide spill kits are in the GH Manual.

6. No treatments will occur over congested urban areas. Whenever possible, plan aerial ferrying and turnaround routes to avoid flights over congested areas, water bodies, and other sensitive areas that are not to be treated.

7. To minimize drift and volatilization, do not conduct aerial applications when any of the following conditions exist in the treatment area: wind velocity exceeds 10 miles per hour (unless lower wind speed required under State law); air turbulence could seriously affect the normal spray pattern; and temperature inversions could lead to off-site movement of spray. Also, suspend aerial applications when the following weather conditions occur and will seriously impede pesticide efficiency: rain (present or imminent), fog, or wet foliage.

8. Weather conditions at the treatment area will be monitored by trained personnel before and during application. Operations will be suspended at any time that weather conditions could jeopardize the safe and/or effective placement of the spray on target areas.

9. Weather plays an important role in aerial application. Winds may displace the pesticide within the target area. High temperatures combined with low humidity may cause fine sprays to evaporate and drift away without reaching the target. The best weather for spraying is usually from dawn through mid-morning. A simple indicator of time-to-quit is soil/air temperature difference. The soil temperature should be taken by placing the thermometer probe on an un-shaded site while shading the thermometer for three minutes before reading. Air temperature should be taken five feet above the surface, in the open but with the thermometer shaded. When the soil temperature rises above the air temperature, the spray pattern normally starts breaking up, at which time treatment operations should cease. Constant monitoring of the spray deposit pattern is the best method of determining the effects of weather factors.

10. Do not apply while school buses are operating in the treatment area. Do not apply within 500 feet of schools or recreational facilities.

11. Protection of Bees:
    a) When off-season or early-season planning indicates an area may require treatment, send early notification letters and maps of the proposed treatment areas to all registered apiarists in the State or near the area.

    b) Pre-spray reconnaissance flights may be conducted to ensure that honey bees and other bees used as commercial crop pollinators have been moved or protected.

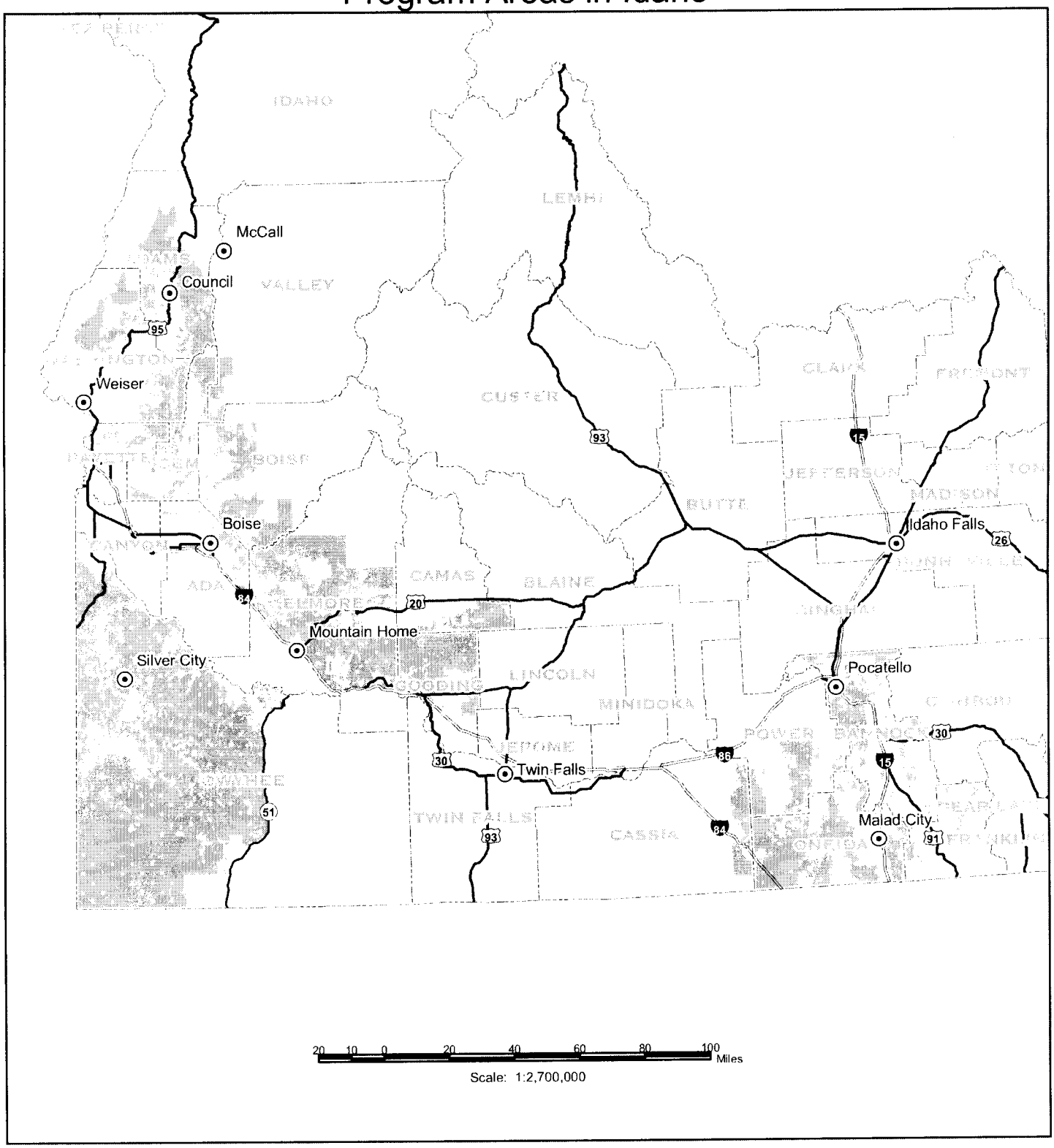
12. When using aerial bait, do not apply the bait directly to water bodies (defined as reservoirs, lakes, ponds, pools left by seasonal streams, springs, wetlands, and perennial streams and rivers), and provide a 200-foot buffer.

SPECIFIC PROCEDURES FOR GROUND APPLICATIONS (BAIT and LIQUIDS)

1. Do not apply ground bait directly to water bodies (defined as reservoirs, lakes, ponds, pools left by seasonal streams, springs, wetlands, and perennial streams and rivers). Furthermore, provide a 50-foot buffer.

2. Safety will be an integral part of each treatment project, contact Western Region Safety Officer for additional information and guidance.

2006 Potential Mormon Cricket Program Areas in Idaho



20 10 0 20 40 60 80 100 Miles

Scale: 1:2,700,000

Source of Data Layers
Mormon Cricket Program Areas: Clipped from Idaho BLM land status corporate dataset
Roads: USGS 1:100,000 Digital Line Graph
Cities: Idaho BLM 1:500,000 corporate dataset

Printed by the Idaho State Office
U.S. Department of the Interior
Bureau of Land Management
1387 S. Vinnell Way
Boise, Idaho 83709
January 2005

Datum: North American Datum 1983
Projection: UTM Zone 11
Units: Meters

Legend

- 2005 Potential Mormon Cricket Program Areas
- County Boundaries
- Cities

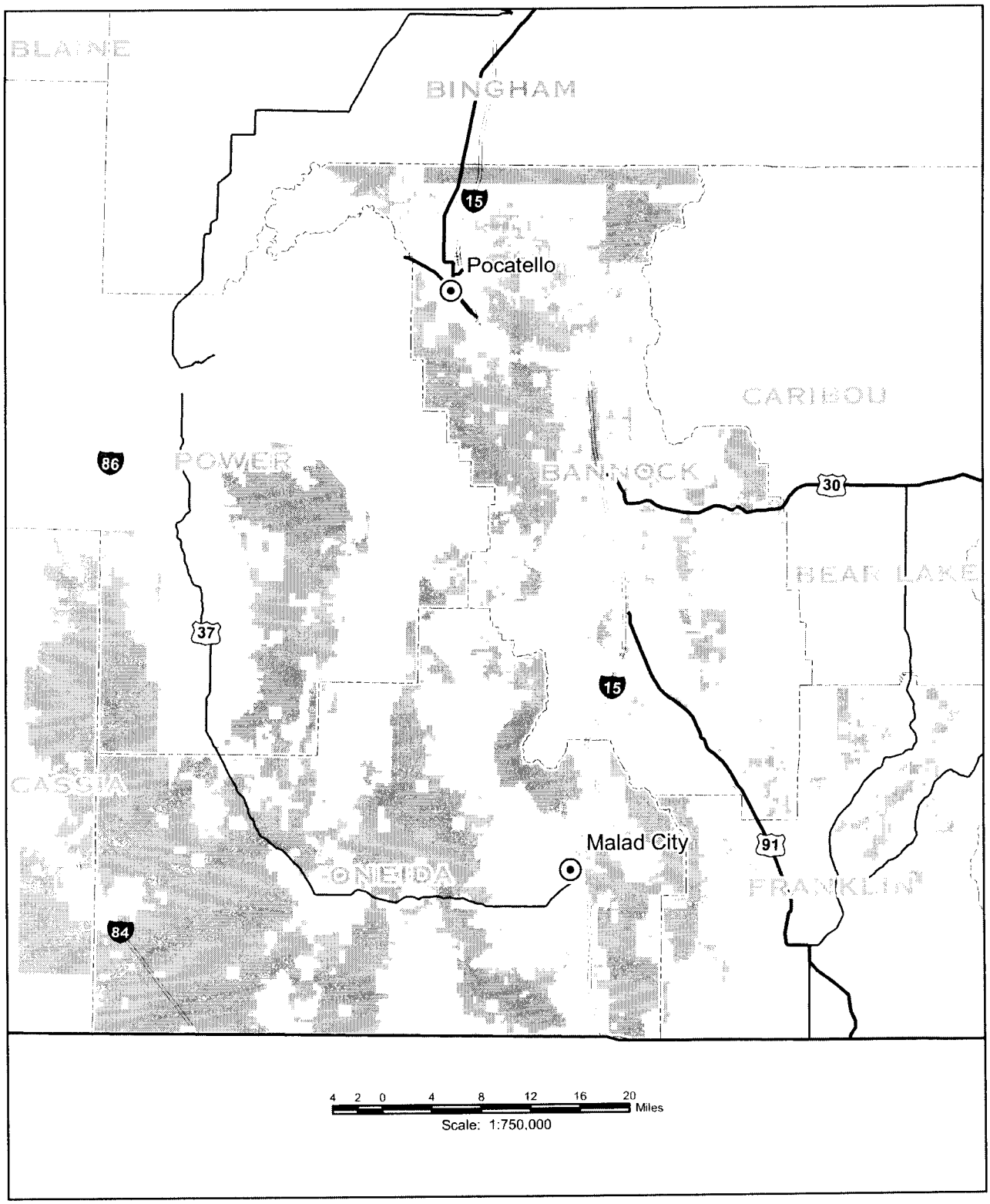
Highways

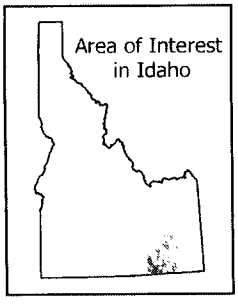
- Interstate
- U.S.
- State

No warranty is made by the Bureau of Land Management for use of the data for purposes not intended by BLM. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data

A-2-1

2006 Potential Mormon Cricket Program Areas in Southeast Idaho





Source of Data Layers
Mormon Cricket Program Areas: Clipped from Idaho BLM land status corporate dataset
Roads: USGS 1:100,000 Digital Line Graph
Cities: Idaho BLM 1:500,000 corporate dataset

Datum: North American Datum 1927
Projection: UTM Zone 12
Units: Meters

Legend

- 2004 Potential Mormon Cricket Program Areas
- County Boundaries
- Cities

Highways
- Interstate
- U.S.
- State

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Bureau of Land Management
1387 S. Vinnell Way
Boise, Idaho 83709
February 2004

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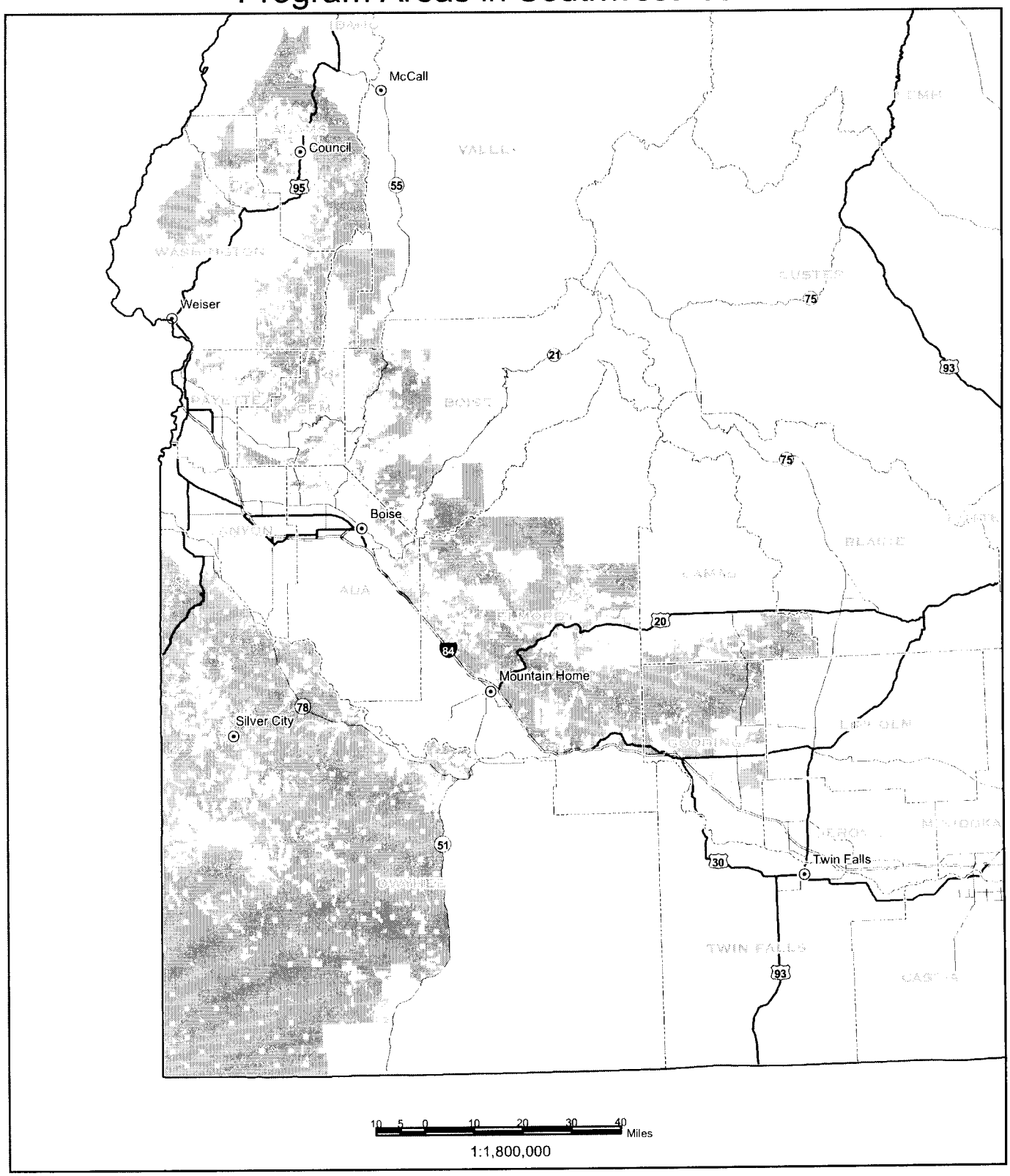
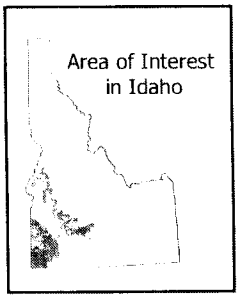
A-2-2

2006 Potential Mormon Cricket Program Areas in Southwest Idaho





Source of Data Layers
Mormon Cricket Program Areas: Clipped from Idaho BLM land status corporate dataset
Roads: USGS 1:100,000 Digital Line Graph
Cities: Idaho BLM 1:500,000 corporate dataset

Printed by the Idaho State Office
U.S. Department of the Interior
Bureau of Land Management
1387 S. Vinnell Way
Boise, Idaho 83709
January 2005

Datum: North American Datum 1983
Projection: UTM Zone 11
Units: Meters

Legend

- 2005 Potential Mormon Cricket Program Areas
- County Boundaries
- Cities

Highways
- Interstate
- U.S.
- State

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A-2-3

APPENDIX 3: Correspondence Regarding Endangered Species Act

Correspondence not received at publication time.

APPENDIX 4. Protocol for Documenting Requests, Evaluations, Recommendations, Consistency Reviews, Treatments, and Monitoring of Rangeland Grasshopper and Mormon Cricket Suppression in Idaho 2006

1. Private landowners and/or public land managers who wish to request evaluations for grasshopper suppression should complete Form 1. *Request for Evaluation of Need for Suppression of Grasshoppers or Mormon Crickets in Idaho*, and fax to USDA in Boise or Twin Falls. Private landowners may also call federal land management or state offices to request the submission of this form. A case number will be assigned by USDA to each request. Requests which involve state or private land will be referred to Idaho State Department of Agriculture.

2. The USDA APHIS PPQ Grasshopper Program Staff will supervise temporary personnel across Southern Idaho. Grasshopper scouts will conduct evaluations in response to requests as well as in areas that are historically susceptible to grasshopper infestations. The grasshopper scouts will complete Form 2. *Survey Evaluation of Idaho Request #___ for Suppression of Grasshoppers or Mormon crickets.* Scouts will submit these reports to USDA in Boise or Twin Falls.

3. Experienced USDA managers will review the scouts' evaluations and determine if follow-up analysis is required. The USDA Grasshopper Coordinator will complete Form 3. *USDA APHIS PPQ Recommendation per Idaho Request #___ for Suppression of Grasshoppers or Mormon Crickets*. USDA will forward this form as well as Forms 1 and 2 to the appropriate federal land manager.

4. Land managers will receive the above-mentioned forms and will determine whether APHIS's recommendation is consistent with the program defined and analyzed in the environmental documentation. The land manager will determine if additional safeguards are required for treatments. Land managers will complete Form 4. *Federal Land Manager Consistency Review of Idaho Request #___ for Suppression of Grasshoppers or Mormon Crickets*. They will forward these forms to USDA.

5. If treatments are consistent with the description and analysis in the environmental documentation and if additional safeguards do not appear to preclude the treatment from being effective, USDA will apply or contract for application of the treatment. USDA will supervise contractors and evaluate the efficacy of treatments. USDA will keep daily treatment records and will complete Form 5. *Summary of Treatment(s) on Request #___ for Suppression of Grasshoppers or Mormon Crickets.* USDA will provide this form to the appropriate federal land manager.

6. Following treatments USDA will conduct post-treatment monitoring for program effectiveness and unintended outcomes. USDA will complete Form 6. *Post-Treatment Monitoring of Treatments on Request #___ for Suppression of Grasshoppers or Mormon Crickets.* USDA will provide this document to US Fish and Wildlife Service and to the appropriate federal land manager.

FORM 1.

*Land managers/owners complete this form and **fax** to **Boise 208-378-5794** or **Twin Falls 208-734-7863.** Or, **mail** to **USDA APHIS PPQ, 9134 W. Blackeagle Drive, Boise ID 83709**. USDA APHIS PPQ and/or Idaho State Department of Agriculture will evaluate the problem and provide recommendations or solutions.*

Party requesting control: Date of request:

Principal contact (if other than party requesting control):

Address:

Phone/cell phone/fax numbers:

County(ies) where rangeland or crop is located:

Owner(s) or land manager(s) of rangeland or crop where control is requested : BLM ☐ Forest Service ☐ State of Idaho ☐ Private party ☐

Estimated acreage infested: _____ _____ _____ _____

Legal description (Township, Range, Sections) of area where control is requested. If legal description is not known, it can be obtained from County Assessor's Office. Please attach map(s) showing land ownership(s):

Describe nature of problem (cropland threatened, rangeland damaged, revegetation project, etc.):

Are you aware of environmentally sensitive issues such as streams or lakes, bees, or endangered species critical habitat in the area where you are requesting treatment? If so, please explain.

****

FOR USE BY PPQ/ISDA

Date and time received: By:

Case #:

Referred to: By: At date/time:

FORM 2

Will be completed by Grasshopper Field Scout and will be submitted to USDA APHIS PPQ or ISDA Manager.

Date evaluated:

Person performing evaluation:

Was complainant contacted during visit? Yes ☐ No ☐

Species of grasshopper or Mormon cricket:

Density per sq. yd.:

Predominant instar(s):
☐ 1
☐ 2
☐ 3
☐ 4
☐ 5
☐ 6
☐ 7

Description of behavior:

Approximate acres of rangeland infested
Federal:
State:
Private:

Is water present within area ☐ or bordering area ☐

Narrative report including other sensitive issues (bees, endangered species, organic farms, etc.):

Attach map showing infested areas and sensitive sites

****

FOR USE BY PPQ/ISDA
Date and time received:
Referred to: By: At date/time:

****

FORM 3

To be completed by USDA APHIS PPQ Grasshopper Coordinator upon receipt of evaluation from Field Scout. Will be forwarded to Federal Land Manager specified in request for evaluation.

I have reviewed the evaluation of complaint #_____ regarding an infestation on
in _____ County, Idaho.
I recommend the following course of action:

_____
Name and title of responsible USDA APHIS PPQ or ISDA Grasshopper Coordinator

Signature_____

Date_____

****
FOR USE BY PPQ/ISDA
Date and time received: By:
Referred to: By: At date/time:
****

FORM 4

To be completed by federal land manager after review of recommendations from USDA APHIS PPQ. Fax to 208-378-5794.

The Environmental Assessment, **"Site-Specific Environmental Assessment, Rangeland _____", and associated Finding of No Significant Impact (FONSI)** have been carefully reviewed. Request for Evaluation for Control, Evaluation of Request and Recommendation for Action #_____have also been carefully reviewed. The recommendation is:

Consistent ☐

Not Consistent ☐

with control actions on rangeland specified by those documents. Any treatment will be implemented by APHIS in accordance with the operational procedures, design features, and mitigating measures described and adopted in the above-referenced documents.

In addition, the following measures are required as well as those referenced above:

Due to the following extenuating circumstances, treatment should not occur:

Signature_____

Name, title and organization of responsible official_____

Date_____

Additional forms required by land management agency should be attached.

****

FOR USE BY LAND MANAGER

Date and time:

Referred to: By:

****

FORM 5
To be completed by USDA APHIS PPQ at the time of treatment

Date(s) treatment occurred:

Contractor or employee(s) who applied treatment:

Acres treated:

Type and amount of pesticide applied:

☐ Carbaryl 5% bait _____ total lbs.
☐ Carbaryl 2% bait _____ total lbs.
☐ Dimilin 2L _____ total oz.
☐ Malathion _____ total oz.

Comments:

_____
Name of official managing control activity.

****
FOR USE BY PPQ
Date and time:
Referred to: By:
****

FORM 6
To be completed by USDA APHIS PPQ at the time of monitoring.

LOCATION OF POST-TREATMENT EVALUATION:

Date(s) of treatments:

Date of evaluation:

Target pest density per sq. yd.:

Predominant species:

Predominant instar(s):

Other monitoring observations:

Name of person conducting post-treatment monitoring

****
FOR USE BY PPQ
Date and time:
Referred to: By:
****